



AQS Fundamentals

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Outreach & Information Division
National Air Data Group
Research Triangle Park, NC 27711

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1 Introduction

Let me guess: You currently work in the air quality division of an environmental information organization. Your boss has dumped a stack of floppies and CD's on your desk and has told you to send this stack of air quality data to the national database repository. What's more, you have also been tasked with getting air quality information from other organizations. You are in a panic! Where do I go?!? What do I do when I get there?!?

Never fear! The United States Environmental Protection Agency (USEPA) is here to help! The place where you want to go is the Air Quality System, or AQS. AQS is THE data source for ambient air quality data in the United States. AQS has information about air quality data beginning in 1957 and continuing to present day. There is information about where air quality monitoring is taking place, what kinds of pollutants are being monitored, and the data itself. State, Local, and Tribal air quality organizations submit millions of data points to AQS annually. These data are stored and summarized in multiple forms. There are summarizations that are generic (such as annual averages, highest values, and number of observations) and some are reflections of the National Ambient Air Quality Standards (NAAQS). AQS is regarded as the most comprehensive resource for air quality information available.

Does all of this sound too good to be true? Well, there is a catch. Given that AQS is so large and some of the summarizations are rather complex, the data may not necessarily be handled in a way that will always make sense to you. That is where this guide comes into play. It is intended to simplify the sometimes confusing process getting data in and out of AQS.

This guide offers step-by-step instructions on performing many of the basic functions available through the application. AQS is constantly changing based on user suggestions and changes in the air quality regulations. Consequently, as time goes on, you may find that some of the screens may differ slightly from the examples presented. However, as with everything complex and wonderful, there are always new things to learn and discover. Hopefully, this guide will give you the background and fundamentals required to understand the premise and allow you find the resources required to get you the information you need.

1.1 A Brief History of AQS

In response to the promulgation of the Clean Air Act of 1970, the Storage and Retrieval of Ambient Data (SAROAD) system was created. Eventually, interest in other types of air quality data grew, and a new system was created. The Aerometric Information Retrieval System (AIRS) stored not only the data from SAROAD, but also had emission inventories from stationary point sources as well as estimated emissions from automobiles. Each of these different types of data constituted their own subsystem within AIRS. The SAROAD portion was called "AQS" for "Air Quality Subsystem". In 1999 it was decided that it would be beneficial for EPA to move their national systems to client-server architecture (your PC handles some of the workload) rather than the

traditional mainframe model that had been used in the past. As part of this decision making process, it was decided that AQS would be the only AIRS component that would be migrated to this new architecture. The “S” in “AQS” changed from “Subsystem” to “System”, since it was no longer a component of a larger system. So you may hear AQS referred to as “AIRS” or “AIRS-AQS” or even as “that new-fangled SAROAD thing”. They all mean the same thing.

1.2 So what is AQS?

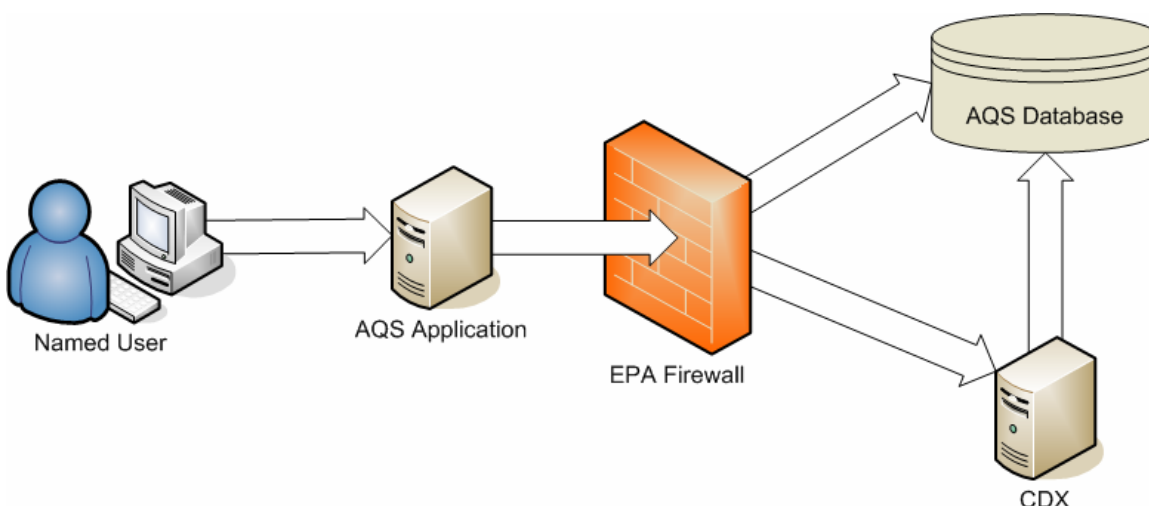


Figure 1-1

As illustrated in *Figure 1-1*, AQS is actually three different systems that act as one unit:

- **AQS Application:** Most people find working with a database very confusing. So “front-ends” are built to help you out. These are the forms and reports that the user interacts with in order to navigate through the system.
- **AQS Database:** A relational database which houses the ambient air quality monitoring data
- **Central Data Exchange (CDX):** Think of CDX as “Windows Explorer” for AQS. This component transfers and manages files to and from AQS.

1.3 Data in AQS

OK... There is no getting around it; AQS is a database and many people find databases very confusing. So instead of talking about AQS in database technical jargon, let’s talk about the type of data that exists in AQS. AQS can be broken down into 3 major categories of data:

1.3.1 Sites

Identified by:

- State, County, and Site Id OR
- Tribal code and Site Id, if it is located on Native American lands

Description:

Site information refers to where on earth the monitoring site is located. A site is identified by its. A site can also be identified by the combination of its. Such

things as latitude/longitude coordinates, what geopolitical areas it is in (like what county, what city, what EPA Region, etc), and local names (such as local address and the local site name for example) are kept here. In addition, information about nearby roads is also stored with the site information.

1.3.2 Monitor Description Information

Identified by:

- The site where the monitor is located AND
- The pollutant code AND
- POC – Parameter Occurrence Code. Used to uniquely identify a monitor if there is more than one device measuring the same pollutant at the same site.

Description:

For the purposes of AQS, a monitor does not refer to a specific piece of equipment. Instead, it reflects that a given pollutant is being measured at a given site. Monitor description information covers several different types of information about how the monitor is configured. When was the monitor operational? How high is the probe? Where is the probe located? How close is this monitor to the highway? What monitoring networks does it belong to? What is the objective of this monitor? Who owns and operates this monitor? These are all good questions that can be answered with this type of information.

1.3.3 Ambient Air Quality Data

Identified by:

- The monitor where the measurement was taken
- The time when the sample was taken

Description:

There are a few different types of data stored within AQS:

1. Raw Data: This is by far the most abundant data in the database. The raw data are the individual measurements collected from the monitors. To date, there are over 1 billion raw data values available through AQS.
2. Precision and Accuracy Data (P&A): In order to ensure that the data collected at the monitoring sites is of high quality, systems of checks are performed. This data reflects the results of these evaluations.
3. Summary Data: Because there is so much raw data submitted to the system, the system creates multiple levels of summaries of the raw data. The data is summarized on a daily, quarterly, and annual basis. Additionally, if there is a national standard for pollutant with a special averaging time (such as a running 8-hour average for example), the system will create these summarized averages as well.

1.3.4 Putting the Data Together

So there you have it! Sites are established to monitor for many different pollutants. The monitors are located at these sites and there is lots of descriptive information associated with these devices. Each monitor can collect a bunch of data. Each data point is collected at a given time by the monitor. Understanding these basic definitions is critical in understanding how the data is organized in the system. So, since pictures can paint a

thousand words, take a look at *Figure 1-2*. The thing to take home are the basic properties of the three major types of data and that as you move from top to bottom, the volume of data you are dealing with greatly increases:

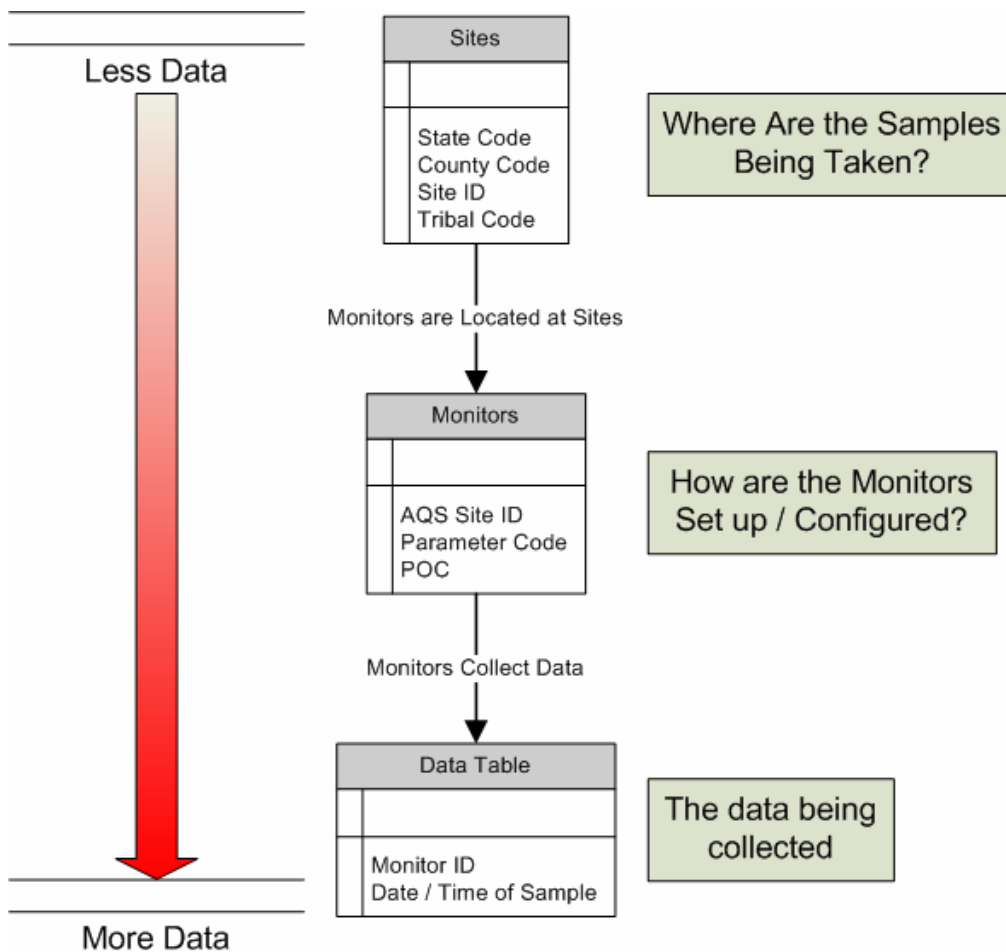


Figure 1-2

2 Who Am I? You and Your User ID

Remember *Figure 1-1*? Keep in mind that AQS is composed of a few different pieces:

- **AQS Application:** Most people find working with a database very confusing. So “front-ends” are built to help you out. These are the forms and reports that the user interacts with in order to navigate through the system.
- **AQS Database:** A relational database which houses the ambient air quality monitoring data
- **Central Data Exchange (CDX):** Think of CDX as “Windows Explorer” for AQS. This component transfers and manages files to and from AQS.

Each of these different pieces resides on a different server at the National Computer Center. As such, you need to be registered on each of these different machines. Fortunately, as part of the user registration process, you will only have one user id. We will discuss a little later how you go about making sure you have the same passwords for the different accounts.

2.1 Registering for a New User ID

The process for obtaining a new user id is fairly straight-forward.

- **STEP 1:** Fill out the “*AQS User Registration Form*”. Keep in mind that the form must be signed by the AQS contact at your agency. An Adobe portable document file (pdf) version of the form can be obtained at <http://www.epa.gov/ttn/airs/airsaqs/registration.htm>
- **STEP 2:** Read and sign the “*AQS User Security Guidelines*”. An Adobe portable document file (pdf) version of the form can be obtained at <http://www.epa.gov/ttn/airs/airsaqs/registration.htm>
- **STEP 3:** Forward the completed forms to the appropriate person. The “appropriate” person depends on the kind of agency that you are representing.
 - If you are a State, Local, or Tribal government official, you forward the forms on to the EPA Regional contact in which you live.
 - If you are a contractor working on a federal contract, you should give the forms to your EPA contract or project officer rather than the EPA Regional contact. The contract or project officer will then contact their ADP coordinator to establish AQS user ids.
- It should be noted that when establishing user ids, the ADP coordinator will establish an Oracle account on AQS.
- There is no cost for having an account, but it is required so we may track usage and to enforce security within the application.

Although none of these steps are difficult, it always seems you get bogged down by the red tape of processing your request. If you have problems with obtaining your user id, feel free to contact:

- Your EPA Regional contact (list of current contacts available at <http://www.epa.gov/ttn/airs/airsaqs/contacts.htm>)
- EPA Helpdesk at 1-866-411-4372. Keep in mind this is the number for all applications run by the EPA, so be sure to mention that you are trying to find out what the story is with your AQS user id.

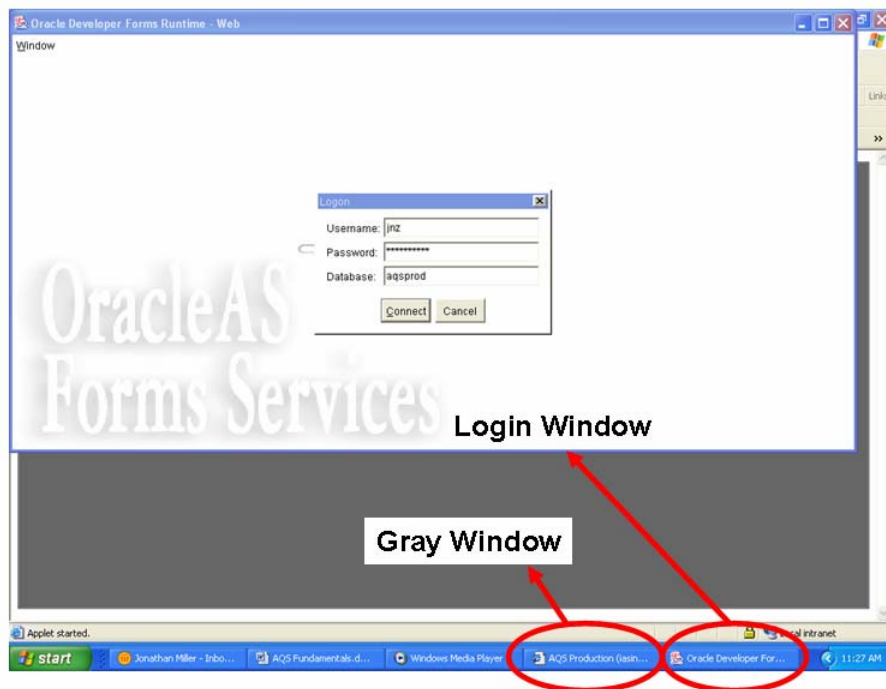
Once you obtain your password, you will be assigned a temporary password. This password will expire the first time you enter the application. You will need to change it and then synchronize it with your CDX id. How do you do that? Funny you should ask! Read on!

2.2 Logging on to AQS for the First Time

You've completed one big hurdle.... You have a user ID. Now it is time to log on to AQS. Ready? Let's go!

- **STEP 1:** Go to <http://www.epa.gov/ttn/airs/airsaqs/aqsweb/aqswebhome.htm>. This web page provides the link to the AQS application. But if this is the first time that you are accessing AQS from a given computer, go on to "STEP 2". If you have signed on to AQS at least once on your current computer, proceed to "STEP 3".
- **STEP 2:** YOU ONLY NEED TO DO STEP 2 ONE TIME FOR A GIVEN COMPUTER.... EVER! Click on the "AQS Initial Setup" hyperlink. This link will provide you with a set of instructions as to how to go about downloading the components needed to properly install the JInitiator software. This process also will also allow you to utilize additional AQS related tools (such as Oracle Discoverer). For a full list of the instructions on this setup, please refer to Appendix A.
- **STEP 3:** Click on the "Proceed to AQS" link at the bottom of the page.
- **STEP 4:** You will be directed to a page indicating that you are about to enter a federal government computer application and that you agree to the terms listed. If you are satisfied with the statement, click on the "I agree to these terms and want to enter the AQS application" hyperlink.

Once you complete "STEP 4", you are on your way to the AQS application. I want you to take a look at some thing here. Notice that two windows are opened. One is just a boring gray screen and the other contains the login window (See *Figure 2-1*). **DO NOT CLOSE THE GRAY WINDOW!** You can minimize it, shrink it, or move it.... Just don't close it. You need this window to stay open as long as you are in AQS in order for some of the reporting functions to work properly.

**Figure 2-1**

The last step in logging into the system is to enter your newly acquired user name and password in the appropriate fields on the form. From this point, it is just like logging on for anyone else. So if you need more help, keep reading the next section!

2.3 Logging into AQS

2.3.1 When Things go Right

In order to log on to the system, have your user id and password ready. Go to the following link:

<http://www.epa.gov/ttn/airs/airsaqs/aqsweb/aqswebhome.htm>

This web page serves as the “launching pad” for giving you access to AQS. From here, click on this button to continue.



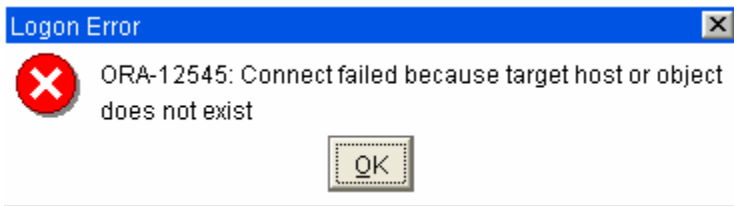
You will be directed to a page indicating that you are about to enter a federal government computer application and that you agree to the terms listed. If you are satisfied with the statement, click on the “I agree to these terms and want to enter the AQS application” hyperlink. You are now at the AQS logon screen which looks like *Figure 2-1*. Notice

that two windows are opened. One is just a boring gray screen and the other contains the login window (See *Figure 2-1*). **DO NOT CLOSE THE GRAY WINDOW!** You can minimize it, shrink it, or move it.... Just don't close it. You need this window to stay open as long as you are in AQS in order for some of the reporting functions to work properly.

You will also see that you have to specify the database to which you are connecting. Unless you are in some kind of a training class, you should connect to the "AQSPROD" database. For AQS, the user id, password, and database can be entered in either upper or lower case.

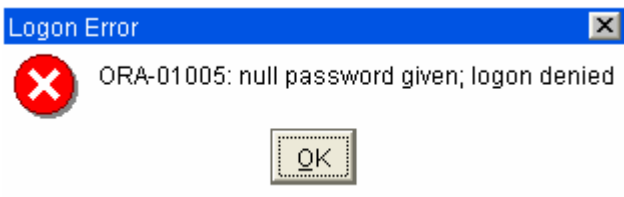
2.3.2 When Things Go Wrong

When you fill out the fields, press the "Connect" button. If you typed everything in ok, you will enter the application. If not, you will get one of the following errors:



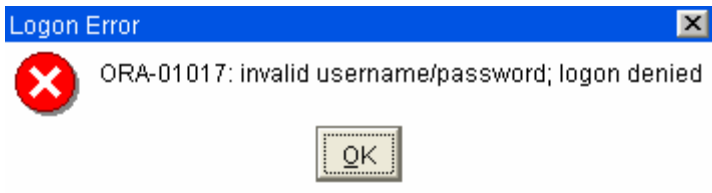
Error #1

You will get this error if you either mistype (or don't type in) the "Database" field. Remember: it should be "AQSPROD"



Error #2

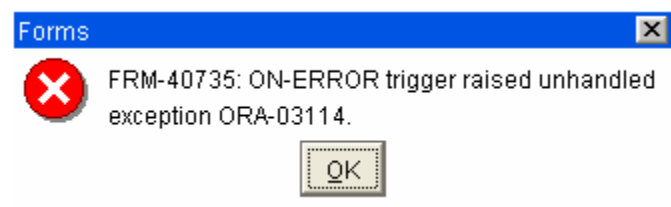
You will get this error if you forget to enter the password or the username field.



Error #3

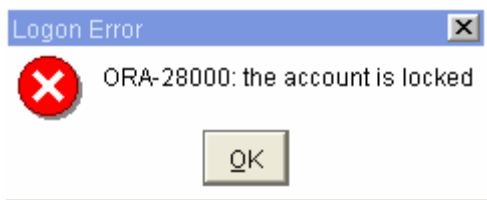
You will get this error if you mistype either the username or password fields. If you have 3 consecutive "Invalid Username /

Password" errors, the application will automatically close and your account will be locked. To unlock the account, you need to call the EPA Helpdesk at 1-866-411-4372.



Error #4

You will get this error if you hit the “Cancel” button.



Error #5

If you have had more than 3 consecutive “Invalid Username / Password” errors, your account will be locked. The only way to unlock the account is by calling the EPA Helpdesk at 1-866-411-4372.

Error #6

OK, so it’s not an error, exactly. This is a warning letting you know that your password is about to expire (or has expired). It lets you know how many days you have before you are required to change it. If you need to change your password, please look in the section of this guide “How to Change Your Password”.

2.4 Changing Your Password

Your AQS and CDX passwords will need to be changed at least every 90 days. That may seem to be exceedingly frequent, but that is the price you pay for having access to federal government mission critical application!

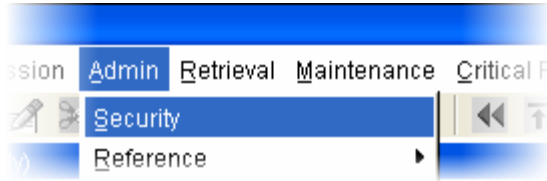
2.4.1 New Password Rules

Because there are lots of clever people out there, your new password must meet certain rules in order for it to be valid and difficult to guess. So the real “Step 1” of this process is to make up a good password. In order for your password to be valid, it must meet all of the following criteria:

1. Must be at least 8 characters long
2. Must contain at least 1 number
3. Must contain at least 1 character
4. Must begin with a character
5. Passwords can only contain A-Z and 0-9
6. You cannot reuse an old password EVER.
7. Password cannot be a common word or a common word followed by a string of digits
8. Password cannot be your user id followed by a string of number.
9. Password cannot be your user id in reverse order followed by a string of number.
10. Password cannot be the name of the server or the oracle instance name (AQSPROD) with or without trailing digits
11. Password cannot be the user’s first or last name with or without trailing (or leading) string of digits.
12. Password cannot be the user’s first initial and last name with or without trailing (or leading) string of digits.

2.4.2 When Things Go Right

Here are the steps needed to change your AQS password (we'll explain how to change your CDX password in a second):



Step #1

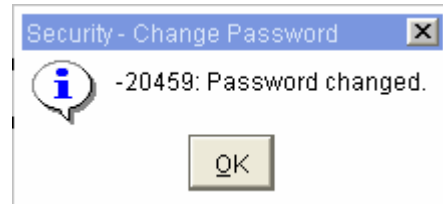
From the Main Menu, click on “Admin” and then “Security” under the “Admin” item.

Step #2

On the section of the Security form labeled “Change Your Oracle Passwords”, enter your new password in the “New Password” field next to the “AQS” label. Press the tab key (or click the “Confirm password” field) and fill out the “Confirm password” field with the same new desired password. Click on “OK” when complete.

A screenshot of the 'Change Your Oracle Passwords' form. The 'AQS' section is active, showing two input fields: 'New Password' and 'Confirm password'. An 'OK' button is visible on the right side of the form.

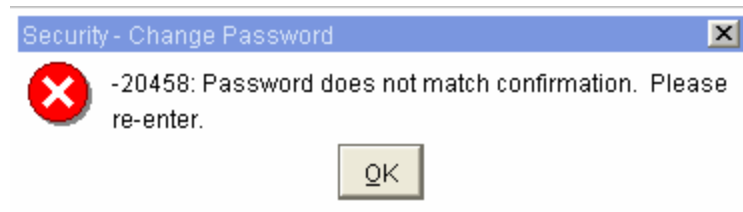
You should receive this if everything is OK. Press the “OK” button to continue.



2.4.3 When Things Go Wrong

Error #1

Your “New Password” must equal your “Confirm password” entries. If they don’t, you will get this error (just admit that you don’t type very well!).



Error #2

If your “New Password” violates any of the rules listed in “New Password Rules” section above, you will get a message specifying what error has occurred.

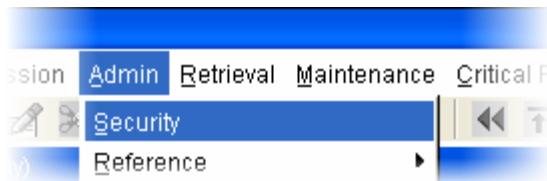
2.5 Synchronizing Your Password with CDX

The folks who brought you AQS realize that it is a pain to keep up with multiple passwords and user ids. Unfortunately, AQS relies on using CDX for handling files to and from the application. Additionally, CDX is a completely different application from AQS. Consequently, it requires its own logon information. Fortunately, the user ids between the two systems are the same. They also have their passwords set to the same initial value when your account is created. AQS has a mechanism in place that assists users in keeping their passwords between the two systems the same. That saves some brain cells in having to remember multiple passwords as you move through the system.

If you have just changed your AQS password, it is a good idea to exit the AQS application and come back in using the recently changed password. There have been instances where the application gets confused as to what the right password is to synchronize with CDX if you don't leave and come back in.... better safe than sorry!

2.5.1 When Things Go Right

If you have managed to change your password, this part will be a piece of cake! All that you need to know is what your current password on CDX is (if you've been keeping your password in sync with AQS, it should be your "old" AQS password). Easy peasy!

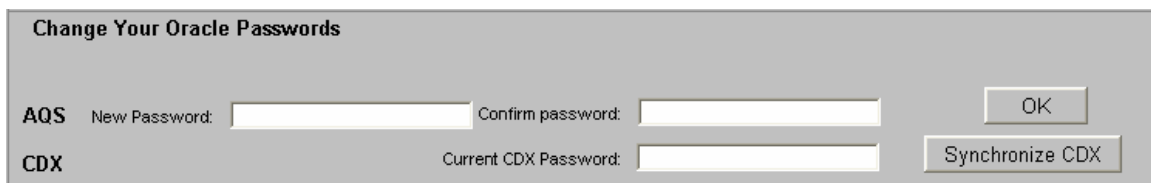


Step #1

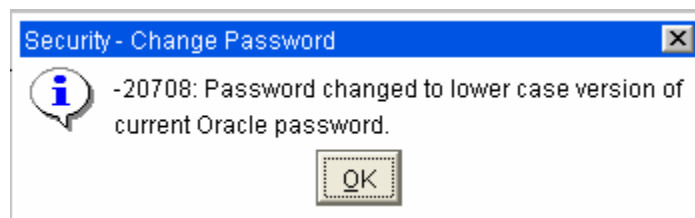
From the Main Menu, click on "Admin" and then "Security" under the "Admin" item.

Step #2

On the section of the Security form labeled "Change Your Oracle Passwords", enter your current CDX password in the "Current CDX Password" field next to the "CDX" label. Click on "Synchronize CDX" when complete.

A screenshot of the 'Change Your Oracle Passwords' form. It has two sections: 'AQS' and 'CDX'. The 'AQS' section has 'New Password:' and 'Confirm password:' fields with an 'OK' button. The 'CDX' section has a 'Current CDX Password:' field and a 'Synchronize CDX' button.

You should receive the following message if everything goes well:



2.5.2 When Things Go Wrong

The only thing that can go wrong is if you don't remember the old password. In this case you will get an error saying just that. Suggestion? Well, either correctly type in the old password or call the CDX Helpdesk (1-888-890-1995) and have them reset your CDX password.

3 CDX – Moving Files Around

EPA's Central Data Exchange (CDX) is the gateway for state and local governments, industry, and tribes to provide their environmental data to the EPA. As mentioned earlier, CDX is a different application from AQS. So why are we talking about it? Because eventually you will want to either put data into AQS or to get data out of AQS and CDX plays a very big role in making that happen.

CDX is a shared application. If there is an environmental program that requires the transferring of data files, there is a good chance CDX is involved. As such, each user with a CDX account is allocated a certain amount of space on the network. Once you have used your space up, there is no more until you do some house cleaning! So remember to keep your area neat!

CDX supports a wide variety of data formats to and from its system. However, for our purposes let's just say that CDX provides all that we need to get files in and out of AQS. In this section we will show how to move a file to make it available to AQS.

You can go to the following areas in CDX (Accessed by the links on the left side of the CDX screens:



- **About CDX:** Provides generic information about the functions and capabilities of CDX
- **MyCDX:** This is the “launching pad” for all the activities that you can perform in CDX. See *Figure 3-2* for an example picture.
- **Inbox:** Link to new files sent to your account
- **Change Password:** Function that allows you to change your CDX password
- **Frequently Asked Questions:** Your standard FAQ type of page
- **Help & Support:** If this excellent guide falls short for your needs, you can look here for more resources (perish the thought!)
- **CDX Home:** The entry point for CDX
- **Terms & Conditions:** This is some legalese to tell you what you legally can and can't do with this application
- **Logout:** Logs you out of CDX when you are all done

3.1 Getting to CDX

You will soon see there are lots of different ways to do the same thing within AQS. This is illustrated by how to access CDX. You can access CDX in either of the following ways:

- Go directly to the CDX website OR
- Access CDX through AQS

3.1.1 Accessing CDX Directly

Once you register for access to AQS, you automatically are registered as a user of CDX. Once you have obtained your user id and password you can log into CDX by going to the following URL:

<https://cdx.epa.gov/SSL/cdx/login.asp>

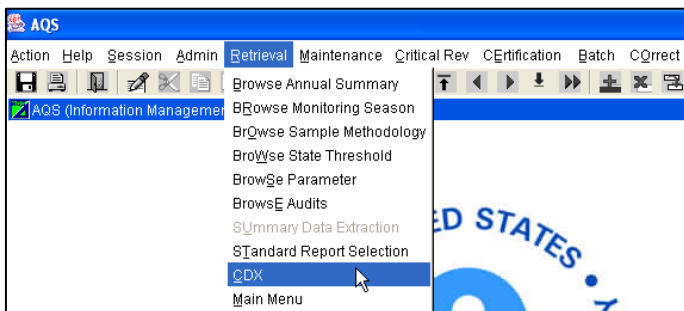
This will take you to the following screen:



Figure 3-1

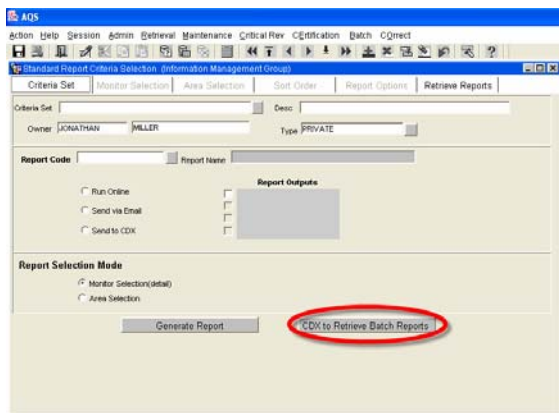
3.1.2 Accessing CDX via AQS

As mentioned earlier, AQS uses CDX as the “traffic cop” of files that are generated from AQS as well as the files that are used to input data to AQS. Consequently, there are multiple links to the CDX login screen (*Figure 3-1*). Each of these methods will open up a new Internet Explorer window. That is to say that the AQS application is still running in another window.



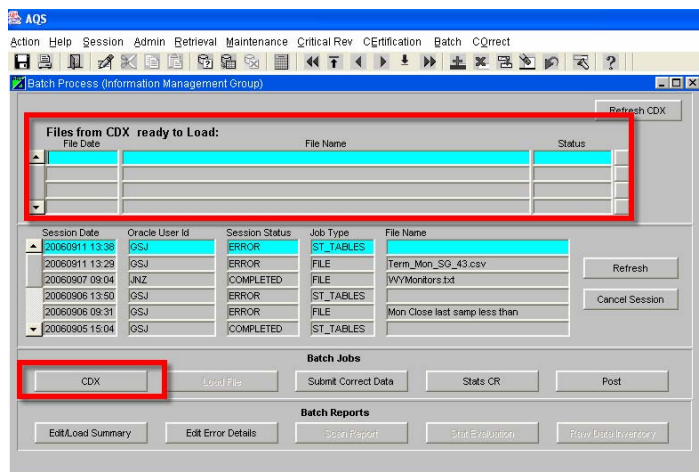
3.1.2.1 From the Main Menu

Perhaps the most direct link to the CDX login screen is on the AQS Main Menu under the “Retrieval” entry. This menu item is available at the top of every screen in AQS.



3.1.2.2 From the Retrievals Standard Selection Form

Since files can be created from AQS and stored in your CDX account, AQS has a button that will take you to the CDX Login screen.



3.1.2.3 From the Batch Processes Form

Since files can be submitted to AQS from your CDX account, AQS has a button on the batch processes form that will take you to the CDX Login screen. Notice that this form also provides a view of the files that are available to be processed by AQS.

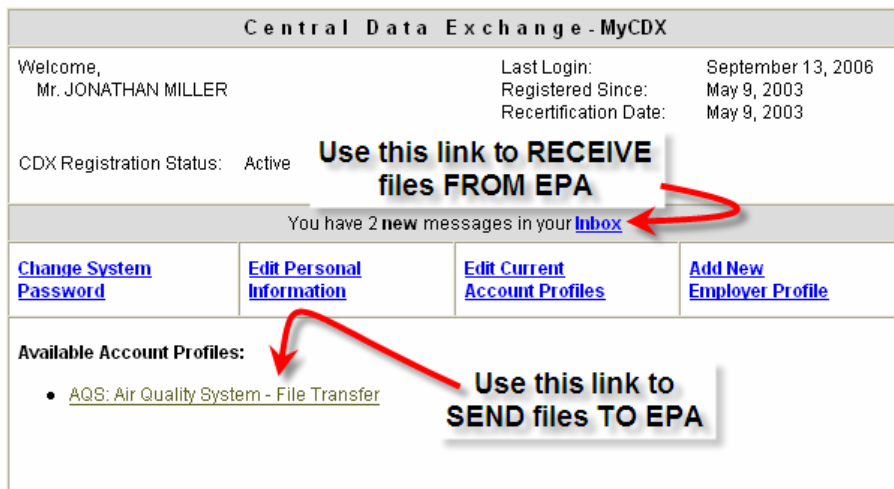


Figure 3-2: MyCDX Page

3.2 Transferring Files to CDX

One of the primary functions AQS serves is the ability to store large amounts of ambient air quality data. In order for that to happen, there has to be a mechanism to getting the data files from here to there (“here” being your computer and “there” being the EPA).

AQS relies on CDX to manage the movement of files. So now that you are in CDX, how do you go about moving files?

Step 1: Log on to CDX by filling out the username and password fields of *Figure 3-1* and clicking “LOGIN”.

AIR QUALITY SUBSYSTEM SUBMITTAL FORM

AQS WEB APPLICATION INSTALLATION

To obtain guidance for installing the AQS Web Application, refer to [AQS WEB HOME](#).

AQS WEB SUBMITTAL FORM - STANDARD FORM

This form is for uploading file submissions to AQS. To pick files for upload, use the Select button. To remove a single file from this upload, use the Remove button. To remove all files from this upload, use the Clear button.

Files submitted may be up to 100 MB in size.

File	Size
[Empty box for file selection]	

[SELECT] [REMOVE] [CLEAR]

Please select SEND to validate your webform and transmit the attached data and files to the U.S. Environmental Protection Agency Central Data Exchange for processing.

[SEND]

Once your file has been successfully uploaded, there may be a brief delay while your file is processed and made available to AQS.

You are in an encrypted secure session.

Help Desk: (800) 890-1995
[EPA Home](#) | [Privacy and Security Notice](#) | [Contact Us](#)

Last updated on September 13, 2006
 URL: <https://cdx.epa.gov/staq/Submit/Submit.aspx?UploadMode=Upload> (SS-1010)

Step 2: From the MyCDX page (see *Figure 3-2*), select “AQS: Air Quality System - File Transfer”. This will take you to the “Air Quality Subsystem Submittal Form”.

Step 3: Click on the “SELECT” button. This will open a file dialog box where you can select files located on your local PC or network device.

Step 4: Select the file(s) that you want to upload from the file dialog box. Click “Open” when complete.

Step 5: You will return to the Air Quality Subsystem Submittal Form with the files you selected appearing in the box. When you have all the files selected, click on the “SEND” button below the box of the list of files. This will open a progress bar that will show how long you have until your files have been transferred.

Step 6: Log out of CDX by clicking the “Logout” link on the menu on the left.

AQS WEB SUBMITTAL FORM - STANDARD FORM

This form is for uploading file submissions to AQS. To pick files for upload, use the Select button. To remove a single file from this upload, use the Remove button. To remove all files from this upload, use the Clear button.

Files submitted may be up to 100 MB in size.

Files (3)	Size (KB)
C:\aqs\Data Requests\05Q3AIRSflow.txt	3,280 bytes
C:\aqs\Data Requests\05Q1AIRSflow.txt	3,280 bytes
C:\aqs\Data Requests\05Q2AIRSflow.txt	3,116 bytes

[SELECT] [REMOVE] [CLEAR]

Please select SEND to validate your webform and transmit the attached data and files to the U.S. Environmental Protection Agency Central Data Exchange for processing.

[SEND]

3.3 Retrieving / Deleting Files from CDX

Under most circumstances, when you generate files from AQS, the files are emailed to you. However, there may be reasons that you store these files on CDX for downloading at a later time. Eventually you will want to copy these files from CDX to your PC (or some other network device). So how do you move the files? Good question!

Step 1: Log on to CDX by filling out the username and password fields of *Figure 3-1* and clicking “LOGIN”.

Step 2: From MyCDX (see *Figure 3-2*), select “AQS: Air Quality System -File Transfer”. This will take you to the “Inbox” hyperlink. This will only be underlined if you have files to download. This link will take you to a screen that looks something like this:

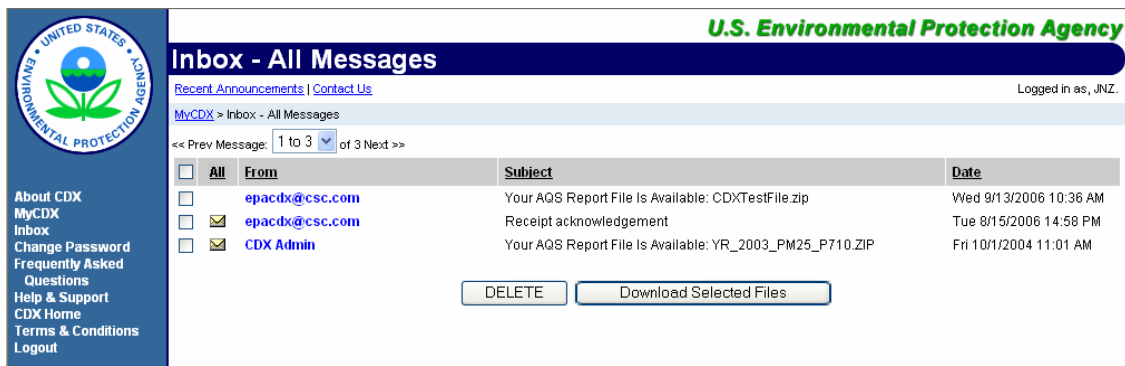







Figure 3-3

So what do we have here?

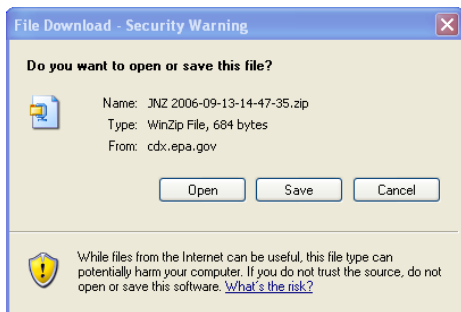
First have a **selection check box**. Use this box to indicate what files you want to deal with. So check the boxes that you want. Next we have a **file type filter**. This column (labeled “All” on *Figure 3-3*) is actually a toggle as to what kinds of files are displayed.

Your choices are:

- “All” Shows read and unread messages
-  Only shows unread messages
-  Only shows previously read messages

Each time you click on the icon, it will change from “All” to  to . These icons also appear next to the files below this column header.  means that a file has not been read. If there is no icon next to the filename, it means that it has previously been read. Next is the address where the file originated. Since these files are generated by AQS processes, the “From” will always be some kind of system user. Clicking on this column label will sort the data by the “From” addressee. Next is the **subject**. Again, this is a generic subject generated by AQS to give you some idea from what process was this file generated. Clicking on this column label will sort the data by the “Subject”. Finally is the **date**. This indicates when the file was created. Clicking on this column label will sort the data by the “Date”.

Step 3: Select the file(s) that you are interested by clicking the check box.



Step 4: Click either the “DELETE” button (to remove the file), or “Download Selected Files” to transfer the files to your PC. If you clicked “Download Selected Files”, you will be prompted with this message box. Click “Open” to see the files, or click “Save” to save the zip file to your local machine.

3.4 Where to go for CDX Help

Do you still have questions on what CDX can do? There are a few different sources for help with CDX:

- **CDX Helpline:** 1-888-890-1995. This helpline is available Monday – Friday, 8 am – 6 pm eastern time.
- **Email:** Send in your questions to CDX Helpdesk personnel at EPACDX@csc.com. Include “Technical Support” in the subject line.
- **Fax:** You can also fax in your question to the helpdesk personnel at 1-301-429-3905. Fax support is available Monday – Friday, 8 am – 6 pm eastern time.

4 AQS Application

As we have mentioned before, AQS contains a lot of data. Navigating through all that data at times can feel like walking into an untamed jungle. Fortunately, there is a clear path through the chaos. The AQS application is designed to take some of the complexity out of dealing with the AQS database. Ready? Let's go!

4.1 About Oracle Forms

A *form* is piece of software that helps you navigate through the system. It may provide a link to another form (like the Main Menu form), or it may display information contained in one or more database tables (like the Raw Data Form). AQS utilizes many forms to display the information in the database. A different form exists for each type of data within AQS. For more information about the different forms, please go to section 4.8 which talks about the "Maintenance" function within AQS. But for now, we are going to look at the various components of a form. As an example, we will use the Raw Data form (basically because it has just about everything that we can expect to see in a form!).

The screenshot displays the AQS application interface. At the top is a menu bar with options: Action, Help, Site, Monitor, Audit, Event, Sample Values, Precision, Accuracy, Blanks, Summary, Concurrence Ind, and Main Menu. Below the menu is a toolbar with various icons. The main window title is "Maintain - Raw Data (Read Only) Tribal Mode". The form is divided into several sections:

- Header Section:** Contains fields for Tribal Code, State (37), County (063), Site (0001), Parameter (88101), POC (1), Begin Date, End Date, and Standard Units (105).
- Raw Data Table:** A table with columns: Raw Data Mp ID, Date, Time, Stat, Reported Sample Value, Standard Sample Value, EPA Ind, Action Ind, Exclusion Ind, Null Ind, Data Code, Description, and Uncertainty Value. The table contains several rows of data, including a row with "POOR QUALITY ASSURANCE RES" under the Description column.
- Qualifier Section:** Contains fields for Qualifier Code (V), Qualifier Desc (VALIDATED VALUE), and Qualifier Type (QA).
- Monitor Protocol Section:** Contains fields for Mp ID (1), Parameter (88101), Method (118), Unit (105), Duration (7), Coll Frequency (1), and Alt Mdl.

At the bottom of the form, there is a "Save" button and a status bar showing "Record: 112/2736" and "<OSC>".

Figure 4-1

As you can see in *Figure 4-1*, there are many different things being shown at one time. Starting from the top, we have the following pieces:



Across the top is the Title Bar for the form. In this case, it is the AQS Application Form. Next is the menu that applies to this particular form. Please note that items on this bar can change. In fact, you'll notice in this example that the menu items are different here than they are for the Main Menu. Below the form menu are the icons for the application. These icons do not change based on the form currently displayed. However, not all icons apply to all forms. If an icon does not apply, then it will be grayed out.

So what do we have below this? That will depend greatly on what type of form you are dealing with. So for right now we'll talk about the different components of the forms rather than how this particular form functions. To see particular features of a given form, please refer to section 4.8 (*Maintenance*) of this document.

Tribal Code	State	County	Site	Parameter	POC	Begin Date	End Date	Standard Units
37	063	0001	88101	1				105

Mp ID	Date	Time	Stat	Reported	Standard	EPA	Action	Exclusion	Null	Uncertainty	Value
1	20060311	00:00	P	4.4	4.4						
1	20060316	00:00	P	8.9	8.9						
1	20060309	00:00	P	17.2	17.2						
1	20060308	00:00	P	14.8	14.8						
1	20060307	00:00	P	11.9	11.9						
1	20060306	00:00	P								
1	20060305	00:00	P	7.7							
1	20060304	00:00	P	7.2							
1	20060303	00:00	P	9.2							
1	20060302	00:00	P	16.6							

Qualifier Code	Qualifier Desc	Qualifier Type
V	VALIDATED VALUE	QA

Mp ID	Parameter	Method	Unit	Duration	Coll Frequency	Alt Mdl
1	88101	118	105	7	1	

Again, starting at the top we have a title bar. This tells you the following:

- What form you are working with ("Maintain – Raw Data")
- The type of access you have according to your session you signed in with ("Read Only")
- If you are working in "Tribal Mode". If you are not in Tribal mode, then this text will not appear.

Next we have Tabs. Tabs do not appear on every form. Tabs provide additional information for a record that currently has *focus*. You can tell which record has focus because it is highlighted in the turquoise color. In this case, the tab will provide any

comments provided for the raw data record corresponding to March 11, 2006 (since that is the raw data record that has the focus).

That leads us into the discussion of *data blocks* or simply *blocks*. Different blocks are separated by a light gray box around their fields. In this example, we have 4 distinct blocks worth of information:

- Monitor Information
- Raw Data
- Qualifiers
- Monitor Protocols

Blocks are collections of records that have a relationship with another set of data. Um... what? Well, in this example you have 1 monitor record (37-063-0010-88101-1) that has a bunch of different raw data value records. So all the records from the raw data block *belongs* to the monitor displayed. Well, the relationships just keep going. The data that shows up in the qualifier block are the qualifiers that have been entered for the raw data record that has focus. So for monitor 37-063-0010-88101-1 on March 11, 2006 (the raw data record with the focus) has a qualifier code of “V” which means “Validated Value. The last block indicated how the data on March 11, 2006 was collected (what method, units of measure, and amount of time needed to collect the sample).

Enter a query, press F8 to execute, C		List of Values
Record: 1/1	Enter-Qu...	List of Valu...

The last component of the form to discuss definitely falls into that phrase “last but not least”. It is the information

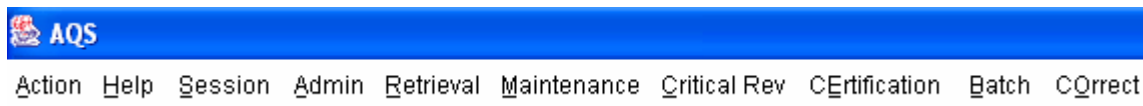
bar. It is at the very bottom of the form, and can easily be overlooked. But it is always a good idea to look down there for some very good information. The top line will tell you what action is expected (in this case, it wants you to enter a query). The first block on the next line will show you the number of records you have retrieved in your query. BE CAREFUL! This record count is for the block where the cursor is currently located. For this example, the cursor was in the monitor block. Sometimes you will see a message here that says “Record 1/?”. The “?” means that not all records have been retrieved yet. The next block shows if you are currently in query mode. What this is intended to show you is if you are entering filtering criteria, or if the query has already been executed. The last block will tell you if the field where your cursor is pointed has a list of values associated with it to help you. As you can see, sometimes these descriptions are cut off. If they are truncated, just place your mouse over the field you want to see and the full description will appear (as shown).

4.2 AQS Main Menu & Icons

The AQS main menu and icons guides you through the various functions available to you within the application. It is important to note that we are talking about the main menu here, which implies that other menus do exist. If there are sub menus or a change in a menu that is available, it will be discussed within the section that causes the menu to change.

Many of the common functions that are performed in the system have icons that can be used to execute the functions. In cases where icons or keystrokes can be used, both will be provided and then you can decide which you would rather use.

The AQS main menu is always located at the top of the form and looks like this:



Here is a brief explanation of each of the elements that appear on the main menu. Each of these will be explained in greater detail in their own section below.

“Action”

As mentioned before, we are interfacing with an Oracle database here. The action functions are common database operations that you may want to use.

“Help”

This menu item will guide you towards available system documentation and explanations of various functions in the system.

“Session”

This is a shortcut to bring you back to the screen where you can select if you want to be a “Read-Only” or a “Screening Group” type of user while you are in AQS.

“Admin”

You can change your contact information as well as maintain your system password here.

“Retrieval”

This is the primary method of selecting data from the system. Data can be created as fixed-formatted reports, work files, or on-line tables.

“Maintenance”

This is an on-line query function that allows you to browse AQS one record (or a small number of records) at a time.

“Critical Rev”

This is a function that can only be accessed by EPA Headquarters personnel. It tracks data that has been marked as being questionable for some sort of reason. The records are periodically reviewed, and data owners are notified if there are continuing questions. This function is not covered in this document.

“Certification”

This is a function that can only be accessed by EPA Headquarters personnel. It allows EPA Personnel to indicate that a given monitor-year’s worth of data has passed all the requirements in order to be certified. This function is not covered in this document.

“Batch”

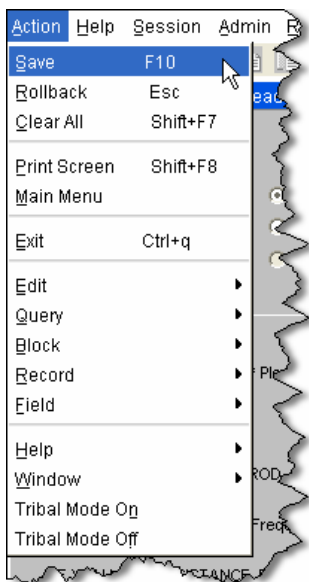
The batch utilities are used when large amounts of data need to be processed into the system.

“Correct”

This utility is used in conjunction with the “Batch” utilities. If errors are identified during the batch editing process, they may be corrected and resubmitted using this

utility. Since the function is so closely linked to the batch process, it is discussed in detail in the “Batch” section of this document.

4.3 Action Functions – Oracle Forms Jargon

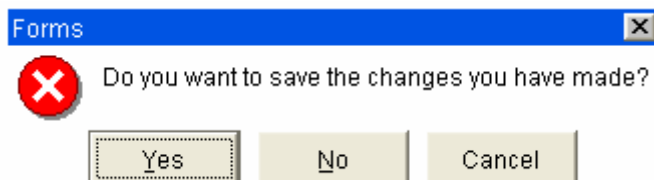


4.3.1 Save versus Rollback

One of the real powers that a database has is that the information that you are seeing is being shared by everyone. The data is stored in a common place (in this case, on a server at the NCC), and follows the same rules for everyone. AQS is a living, breathing thing. The data within it are constantly changing. If you have access to a screening group, you may have the ability to change information in AQS as well. If you do, you need to understand the concept of “Save” and “Rollback” as it applies to the database.


4.3.1.1 Save

When you attempt to change data that is stored on tables within AQS, the change doesn’t take effect until you *save* (or *commit*) those changes. You cannot “undo” or “go back” once you save your changes. If you have saved your changes, your only choice is to manually change them back. So when do you need to save? Keep in mind that unless you are querying data, any entry that you make into AQS is probably updating a table. So many times when you try to leave a screen, you will get a message that looks like this:




What this is trying to tell you is that you have made a change somewhere in the database and if you want to SAVE these changes.

So how do you go about saving your data? As usual, there are several options:

1. Since we are in the “Action” menu item section, I guess we should mention this option first! Click on “Action” → “Save”.
2. As you have already seen, if you try to leave a screen you will be asked if you want to save your changes. Answering “Yes” will save your changes.
3. Click on the “Save” icon. It is in the upper left corner of the screen and looks like this  →
4. Hit the “F10” key on your keyboard. Note that the action menu will show alternative key strokes that you can use if they are available.

4.3.1.2 Rollback

A “rollback” will erase all changes made to the database since the last time you saved. In general, AQS does not let you go too far before it makes you save your work, so honestly, this function is quite limited. However, you may find the occasional need to erase and start over. So here’s the different ways to “Rollback” your work:

1. Since we are in the “Action” menu item section, I guess we should mention this option first! Click on “Action” → “Rollback”.
2. As you have already seen, if you try to leave a screen you will be asked if you want to save your changes. Answering “No” will rollback your changes.
3. Click on the “Rollback” icon. It is towards the upper right side of the screen and looks like this 
4. Hit the “Esc” key on your keyboard. Note that the action menu will show alternative key strokes that you can use if they are available.

4.3.2 Navigation Buttons (Main Menu & Exit)



There are several places within the AQS menu structure that have a short cut to the “Main Menu”. To the left is a screen capture of the Main Menu form. There really isn’t anything that you can do on this form other than use it as a launching point to all the other areas within the application.

Forms Services



The other short cut navigation button that is available is the “Exit” function. This will end your AQS session. If you have made changes to the form that you are on, you will get a message prompting you if you want to save your changes. If you haven’t made any database changes since the last time you saved, you will exit the system. As usual, there is more than one way to exit the application:

1. Click on “Action” → “Exit”.
2. Hold down the “Ctrl” key and “q” on your keyboard.
3. Click on the “Exit” icon. It is the third icon moving from left to right.






4.3.3 Oracle Form Functions (Edit, Query, Block, Record & Field)

If you have general questions about Oracle forms, please refer to section 4.1 (*About Oracle Forms*). These function all relate to dealing with fields and records displayed in the forms. Nearly all of the functions provided on the menu are available through the use of icons and / or short cut keys. In these cases, the alternate methods of executing the functions will be provided.

4.3.3.1 Edit



The edit functions allow you to perform basic functions against a field. The following functions can be performed under the “Edit” list:



- Cut  (Ctrl + “x”)
- Copy  (Ctrl + “c”)
- Paste  (Ctrl + “v”)
- Display list (F9) – This will produce a “Drop down” list of entries for the field where your cursor is currently located (if applicable).
- Edit (Ctrl + “e”)

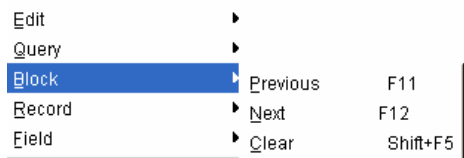
I’ve included the “Edit” function, but it is a fairly useless function. This is because AQS controls what mode a record is in based on the authority you have for the record. So basically, either you have edit authority or you don’t. So if you ever find a neat use for this function, let me know!



4.3.3.2 Query

As the name implies, these are functions that you can do while you are trying to query records from the database. The following functions can be performed from the “Query” list:

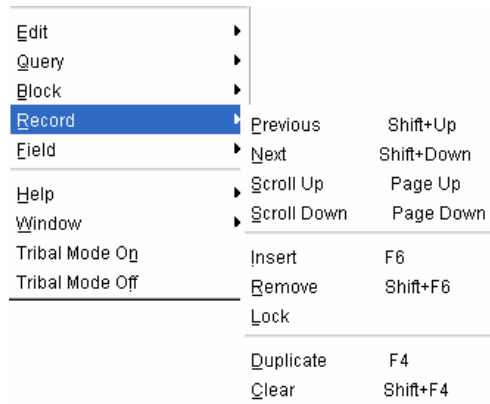
- Execute  (F8) - Executes the current query with the filter criteria entered.
- Cancel  (Esc) – Cancels the current query
- Last Criteria – This will load the last set of values for which you queried in the form.
- Count Hits (Shift + F2) – Counts the number of records that the query will return. This is especially useful when you get a message that says “Record 1/?”. Selecting this function will replace the “?” with the number of records that the query finds.
- Fetch Next Set (Ctrl + “>”) -



4.3.3.3 Block

Admittedly, these functions also have limited use. However, they are included for completeness sake. These controls are really designed for those who

really don’t like to work with a mouse. Essentially the “Next” and “Previous” will step you to different areas of the form, one section at a time (or one Tab at a time if applicable). This can easily be performed by clicking on the area of the form you would like to be in. The “Clear” function simply clears entries that are in any field with the block where the cursor is located. This is duplicated by using the “Enter Query” function.



4.3.3.4 Record



As you can see from the picture, there are a lot of functions under this menu item. However, since most of them have alternate keystrokes and / or icons, the menu items themselves are pretty limited in the usefulness. But there are lots of good icons to introduce here, so let's get going!

Menu Item	Description	Icon	Keystroke
Previous	Takes you to the previous record selected by the query		Shift + "Page Up"
Next	Takes you to the next record selected by the query		Shift + "Page Down"
Scroll Up	This will display the previous set of records that can be displayed on a scrollable block of records		"Page Up"
Scroll Down	This will display the next set of records that can be displayed on a scrollable block of records		"Page Down"
Lock	No real use for this function given that the access to records in AQS is based on your role in the current session.		
Insert	Inserts a new record into the current block below where your cursor is currently located.		F6
Remove	Deletes the entire record where the cursor is currently located		Shift + F6
Duplicate	Makes a copy of the record where the cursor is currently located and places in the very next record line. This can only be used in a multi-record type of block.		F4
Clear	Erases all the entries for a given record. It does not delete the record. It makes all the values for the record NULL		Shift + F4
	Goes to the first record selected by the query		
	Goes to the last record selected by the query		



4.3.3.5 Field

Much like the "Block" functions, these functions also have limited use. However, they are included for completeness sake. These controls are really designed for those who really don't like to work with a mouse. Essentially the "Next" and "Previous" will step you to different areas of the

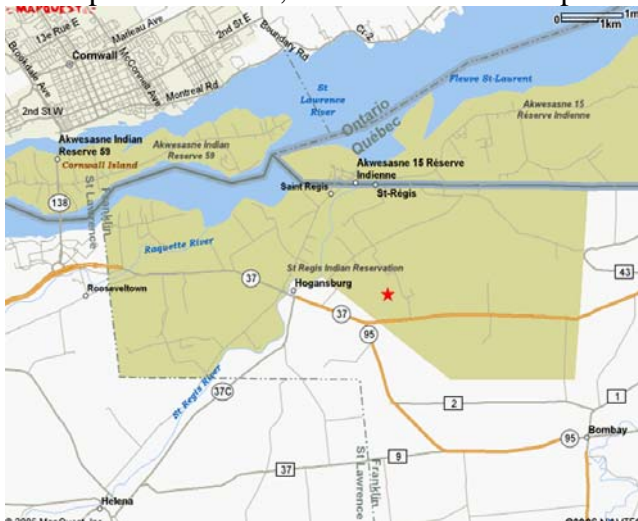
form, one field at a time in the order determined by the programmer. This can easily be performed by clicking on the field in the form you would like to be. The “Clear” (Ctrl + “u”) function  simply clears the content of the field where the cursor is located. It is essentially the same as a “Delete”. The “Duplicate” (F3) function  will copy the contents of the current cell with the value from the record directly above it. Obviously, this function will only work if there are multiple records displayed within a given block.

4.3.4 Working in “Tribal Mode”

Remember at the very beginning of this manual we talked about what uniquely identifies a site in AQS? Actually, I don’t remember either, so it’s worth mentioning again. There are two ways that you can select sites in AQS:

1. Specify the **State code, county code, and site id** where the site resides. This is the default method of identifying sites in AQS. However, there is another way.
2. Specify the **Tribal Code and site id** where the site resides. For those sites that exist on Tribal lands and the owners of the data have identified which Tribal lands to which these sites reside, you can identify the site by this combination of values.

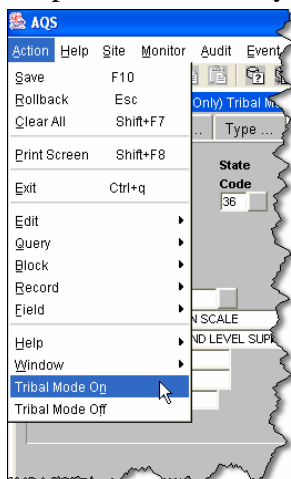
To help illustrate this, take a look at the map below:



Let’s say we have a site located at red star on the map. The site ID for this site is “0001”. This site clearly would reside within the St. Regis Mohawk Indian Reservation (Tribal code = “007”). However, it also resides within Franklin County, New York (State code = “36” and county code = “033”). So, within AQS you could either identify this site as:

- 36-033-0001 (default mode)
OR
- TT-007-0001 (Tribal mode)

By checking the “Tribal User” box on your user profile, you set the default method of displaying site id in the Tribal mode versus the default mode. This method of displaying the sites applies to all forms and reports within the system.



If you are wondering if you are currently in Tribal mode, just look at the blue bar at the top of your form. If you are in Tribal mode, the bar will look like this:



Where the words “Tribal Mode” will appear after the listing of your currently selected screening group or “Read Only”.

So how do you tell AQS that you want to view the data in Tribal mode or Default mode? Two ways:

1. The last two items on the “Action” menu bar will let you toggle between “Default Mode” and “Tribal Mode” by either turning the Tribal mode “On” or turning the Tribal mode “Off”.
2. To make viewing data in Tribal mode your default setting when you sign on to AQS, check the “Tribal User” check box on the “Admin” → “Security” form on your user profile (See section 4.5 for screen prints of this form). The Tribal user check box is in the bottom right corner of the user information of this form.

4.4 Help

Help	
Help	
Keys	Ctrl+F1
Display Error	Shift+F1
About	

Well, I’ve tried to structure this guide according to the way the items are laid out on the main menu. As with any good plan, occasionally one must stray from the plan a bit. The “Help” menu item is such an item. Many of the most helpful elements of the system are not accessible through the menu structure. In fact, some aren’t even in the application at all! But we will look at what is available through the application first.

4.4.1 Application Help

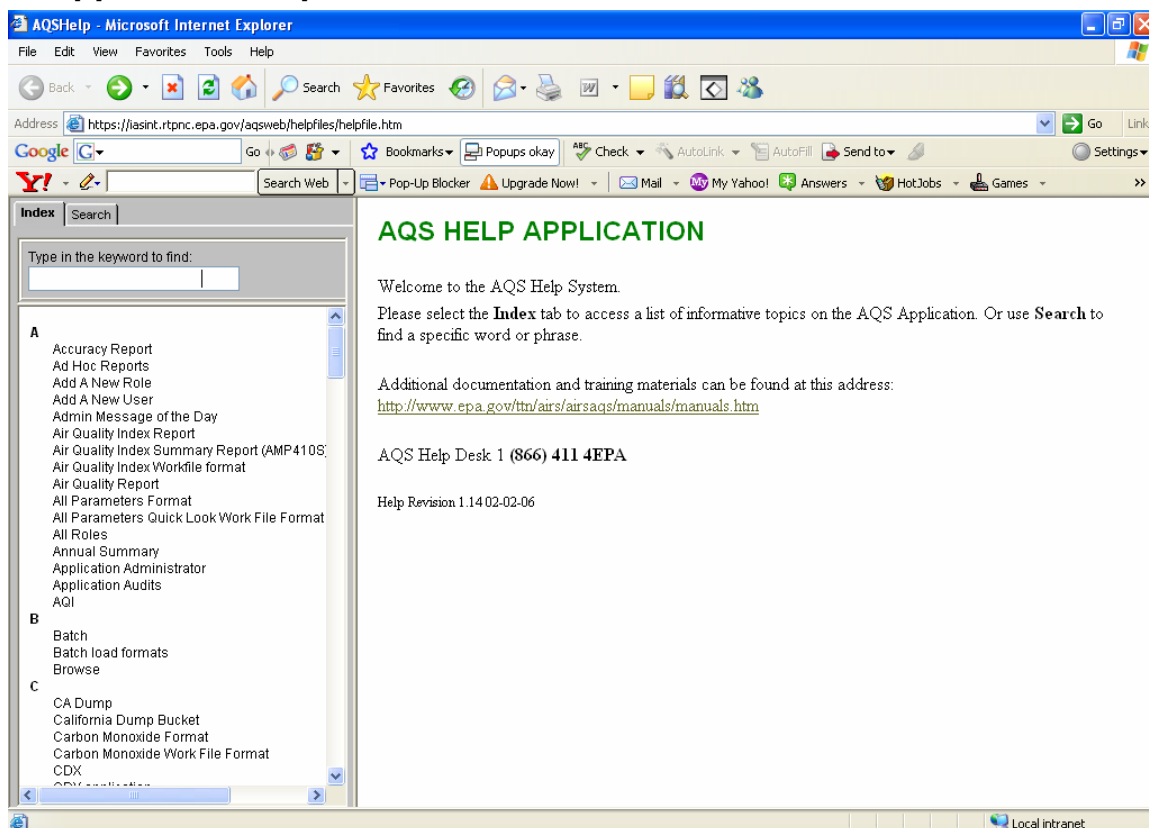


Figure 4-2

Of the four choices that appear on the “Help” menu, the first item (“Help”) is the most useful. When you click on “Help” (or F1 if you prefer), you will be taken to the on-line help. This is an application that is external to the application and will open another browser window. The topics are organized in two ways:

- Index
- Search

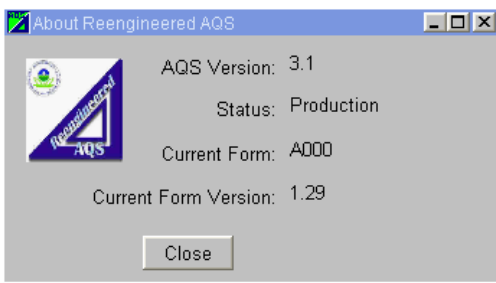
Each of these options is accessible through the left hand side of the application (see *Figure 4-2* above). For the Index feature of help, when you click on a displayed topic, the information for that topic will appear on the right. For the “Search” feature, type in a word or phrase that you are trying to get help with (“Probe Height” for example). Hit the “Enter” key to execute the search. All topics with the word or phrase in the title or the description will be displayed on the left-hand side of the screen. Again, click on the subject of interest to see the detailed description on the right side.

4.4.2 Other Help Menu Items

There are three other menu items available to you: “Keys”, “Display Error”, and “About”. The “Keys” item (also invoked by Ctrl + F1) will show you a listing of all the short-cut keystrokes available in the system. The last two items can be very helpful if you are having problems. This information may not help you, but it will help our support staff root out your problem. The first is the “Display Error” (also invoked by Shift + F1).

FRM-42100: No errors encountered recently.			
Record: 1/1		...	

Selecting this function will display the last error encountered on the message bar at the bottom of the form. Always




keep an eye on this portion of the form. It doesn't really jump out at you, but the system is trying to provide you with useful information. The other function that is available through the help menu is “About”. “About” provides a description of which form you are currently using. For example, from the “Sessions” form, clicking on “About” provides the information you see on the left. Noting this information can

be very helpful to the programmers to find any errors that may be happening within the system.

4.4.3 Field Level Help

There is another category of help that is available through the system. It is the field level help. This is information that is provided as you are on a given field within the system. The information is displayed in the information bar at the bottom of the screen. For example, if you put your cursor on the “State Code” field on the Maintenance → Site form, you will see this information appear in the information bar:

Enter a State FIPS code that identifies one of the 50 states or other countries.
--

This information can also be acquired by pressing the  icon in the upper right of the icon bar. Although the information it displays is nearly identical to what is presented in the information bar, it is displayed in a separate window using the Help function interface. Some people find this interface a better since they could then go and find help on other items in a separate application without interfering what they are doing on AQS. As usual, many ways of doing the same thing.

4.4.4 User Manuals and Guides

The final area of help is the user manuals and guides that we make available for the system on OAQPS Technology Transfer Network (or the TTN). The manuals are all available in Adobe's Portable Data File (PFF) format. The manuals provide the most detailed documentation for how fields are derived and used with the AQS application. You can find these manuals at <http://www.epa.gov/ttn/airs/airsaqs/manuals/manuals.htm>.

4.5 Sessions & Screening Groups

The first confusing thing that we must address is this concept of a “Session” and a “Screening Group”. These items are used extensively throughout the system and will determine what features will be available to you.

After you enter your user id and password to enter the AQS application (see section 2.3 “Logging in AQS” if you have question as how to do this), you will be given a screen that looks like this:

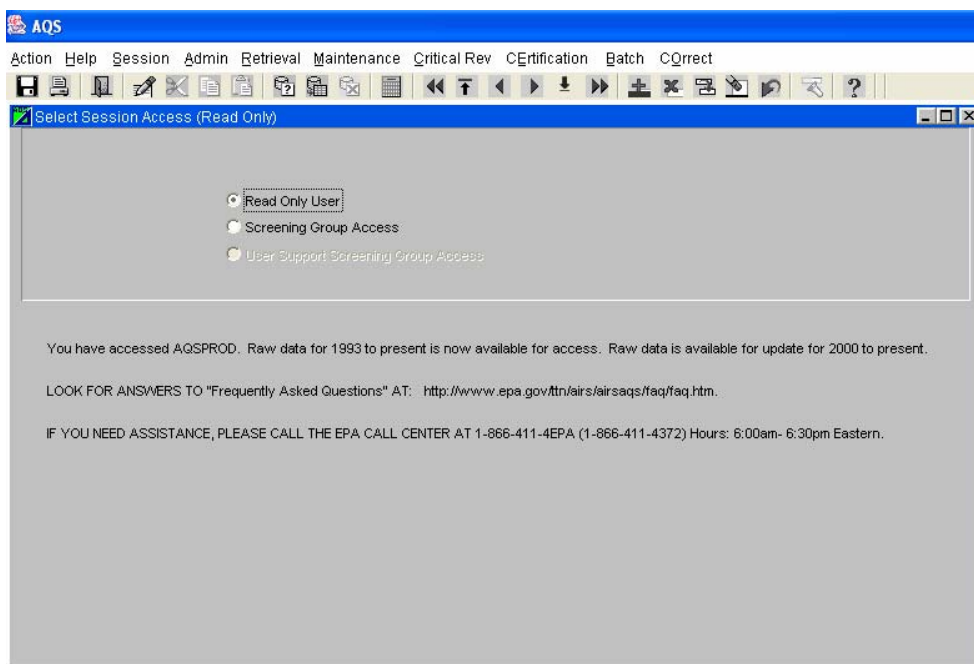


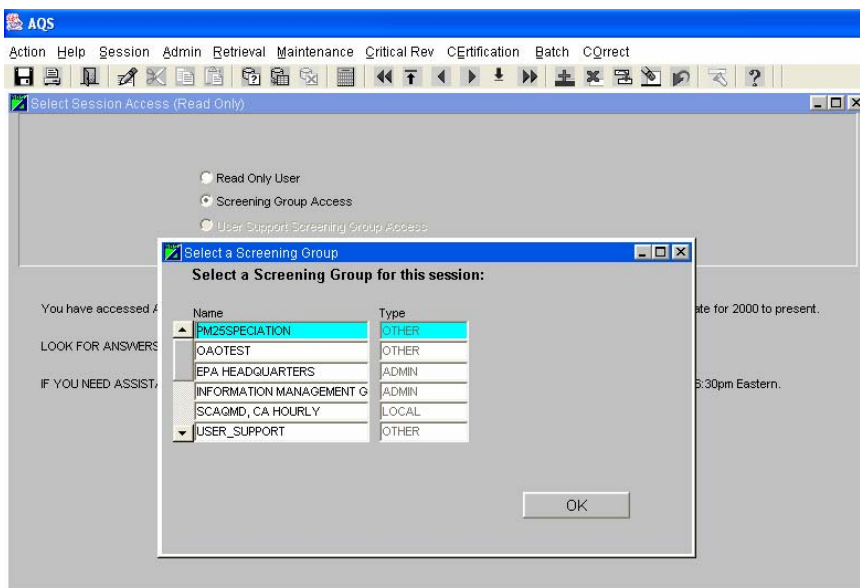
Figure 4-1

4.5.1 About Sessions

Whether you know it or not, as soon as you enter AQS you start a *session*. A session is a profile that you establish for yourself when you enter the system. The default profile that is granted when you enter is the “Read Only User” profile. What this means is that you can see all data that has been deemed ready to be given to the public by the owner of the data. Notice in the blue bar above the radio button that it has the name of the form you are working with (in this case, the “Select Session Access” form) as well as what type of *role* you are assigned (“Read Only” in this case). The “Read Only” role should be selected if you only need to look at data. If you need to insert, update, or delete data that you own, you need to select a **screening group**. Umm.... A what?!?! Read on!

4.5.2 About Screening Groups

A *screening group* is an organization that owns monitors within AQS. This organization could be a state agency, a county agency, a tribe, an EPA office, a private organization, or a government contractor. You may have been given access to many different screening groups, or you may have access to no screening groups. It all depends on how your user profile was established when you filled out the registration form (See section 2.1 “Registering for a User ID” for more information). You can see what screening groups you have access to by clicking on the “Screening Groups Access” radio button on the “Select Session Access” form. When you do, your screen should look something like this (your list of screening groups will very likely not be the same):



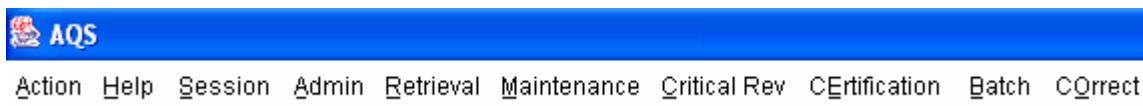
Select the screening group that you would like to work with. Most of the time, you will only have one screening group to choose from. Click on the “OK” button when complete.

Notice the blue bar above the radio button has changed to show that you have selected a

screening group:

4.5.3 “Read Only” Versus Screening Group Access

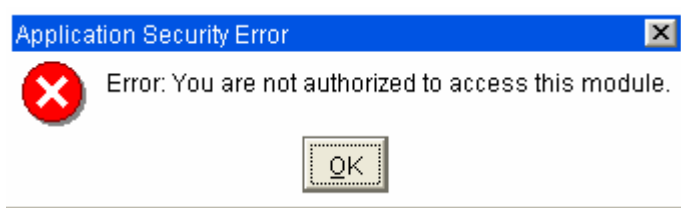
So is there a big difference in entering the system as a read-only user verses one with a screening group? **YES!** First of all, you are prevented from certain areas of the system is you are a read-only user. Take a look at the following chart. It illustrates what menu items are accessible depending whether you are signed on as “Read Only” or with a screening group:



Menu Item	Selected User Access		
	Read Only	Screening Group	Admin
Action (Any item)	✓	✓	✓
Help (Any item)	✓	✓	✓

Menu Item	Selected User Access		
	Read Only	Screening Group	Admin
Session	✓	✓	✓
Admin – Security	✓	✓	✓
Admin – All other options	✗	✗	✓
Retrieval (Any item)	✓	✓	✓
Maintenance (Any item)	✓	✓	✓
Critical Rev (Any item)	✗	✗	✓
Certification (Any item)	✗	✗	✓
Batch (Any item)	✗	✓	✓
Correct (Any item)	✗	✓	✓

Hey! Wait a minute! What is this “Admin” column that suddenly showed up?!? Well, this is a special role that is available to a few users (the author of this guide being one of them). These are special functions and tables that are needed to be maintained to keep the system running. I have included this role to show who has access to these other menu items. If you try to select a menu item that you do not have appropriate access based on your session profile, you will get this message:



So there are a couple of menu items that can't be accessed as a read-only user. What else? If you sign on as a read-only user, you can only view data that has been approved by the data owner as ready to view. There are some reports that look at data that is “pre-production” (not ready to be viewed by everyone). These reports are not accessible to read-only users. This will be explained more thoroughly in section 4.3 *Retrievals – Getting Data out of AQS*.

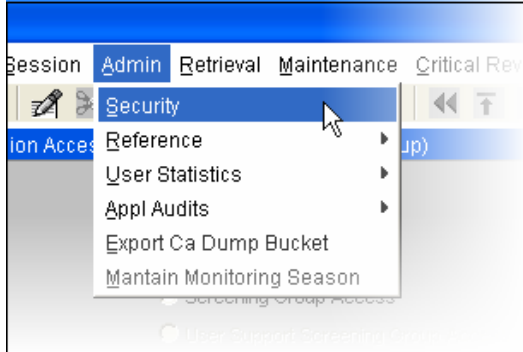
In a similar fashion, the data you can access using the “Maintenance” function varies greatly depending what kind of access you select during your session.

- Read-only: You can access any data that is classified as “Production” data
- Screening Group Access: You can select any data (production or pre-production) from any monitor that the screening group owns. However, you cannot access any data that is not owned by the screening group.

This will be explained in greater detail in section 4.4 *Maintenance – Reviewing, Editing, and Creating Data*.

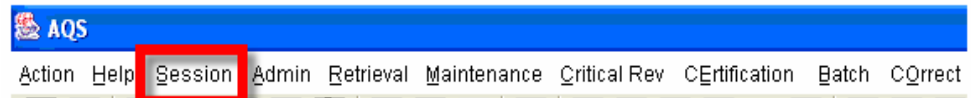
4.5.4 Changing Your Session Profile

If you realize in the middle of working with AQS that you need to change from a read-only user to start working with one of your screening groups (or vice versa), it is no big



deal. You can change your session profile at any time. All you have to do is click on the “Session” menu item:

Clicking on this menu item will send you back to the screen shown in *Figure 4-1* and you can then select your new profile.



4.6 Administration Tools

For most users, there is only one active menu choice under the “Admin” main menu: “Security”. This will allow you to change descriptive information about yourself as well as give you access to changing your AQS and CDX passwords. When you select “Admin” → “Security”, you will see the following screen:

Administration - Application Security (Read Only)			
User Profile		Maintain Security	Security Reference Tables
First Name	JONATHAN	Initial	K
Phone	919-541 7738	Street Address 1	EPA Building
Zip Code	27711	City	Research Triangle Park
County Code	063	State Code	37
User ID	JNZ	User Type	H
Fax	9195417738	Status Ind	P
E Mail	miller.jonathan@epamail.epa.gov		
Last	MILLER	Agency Code	1108
Street Address 2	Room 335F	AQS Contact	N
		EPA Region Code	04
		Tribal User	<input type="checkbox"/>

Change Your Oracle Passwords			
AQS	New Password:	Confirm password:	OK
CDX		Current CDX Password:	Synchronize CDX

Your user information is automatically selected. You will not have the ability to look at information for anyone else. Notice there are two sections in this form. The top half of the form provides information that you are able to change. Where lists of values are available, a drop-down list is provided. The bottom half of the form allows you to change your AQS and / or CDX passwords. Detailed instructions of how to change your passwords are found in sections 2.4 *Changing Your AQS Password* and 2.5 *Synchronizing Your CDX Password*.

4.7 Retrievals – Getting Data out of AQS

When you get right down to it, AQS can essentially do two things: Get data into the system, and get data out of the system. This section deals with how to get large quantities of data out of the system in a formatted report. There are many different types

of reports and formats, and options available when you are creating reports in AQS. Collectively, these filter options, report options, and output options are called a *criteria set*. Criteria sets can be saved for later use or saved in a “public” area to be used by other users. So let’s get started, shall we?!?

4.7.1 Overview

The standard report criteria interface screen (also referred to by its module name as the “**R31 form**”) is the mechanism by which all standard reports are created. The R31 form collects the following information from the user in order to create a report:

- What report to run
- The type of output desired
 - Formatted report
 - Text workfile
 - XML output
- Delivery Method
 - On-line (interactively)
 - Batch (background)
- What data to be included in the report
 - By geography
 - By time periods
 - By reporting organization
 - By screening groups
 - By land use
 - By monitor types
 - By parameter, parameter category, sampling duration, and/or sampling methodology
- Specify report sort order
- Select report options

Collectively, this information is called a “Criteria set”. Criteria sets can be named and saved to be used at a later time. This topic is covered in detail under **Section 2.2.7: Saving Criteria Sets** and **Section 3: Using Saved Criteria Sets**.

It is important to realize that not all parts of R31 are available for all reports. For example, if you were creating a report for annual summary information, it would not make sense to base your time selections on a Year / Month / Day basis since the report only displays data on a yearly aggregation.

4.7.2 What is Returned

The type of information that is sent back to the user is very much dependant on what type of report has been requested. All reports have a cover page which shows the following information:

- What report was run
- What information was supplied to R31 to generate the output

This report is always generated in Portable Document Format (PDF). If a “REPORT” output option is specified and the report is also generated in PDF format, the cover sheet and the report may be “merged” together into a single document. At this time, you must specify the “REPORT MERGE” option to “YES” in order for this feature to work. For more information, see section 2.2.6.1, “Merge PDF File Option” for more information.

If the output of the report is in a different file format from the cover page or if the “REPORT MERGE” option is set to “NO”, then a ZIP file is created containing the PDF cover page and the various requested report formats.

4.7.3 Tribal Mode

Within the application, sites may be identified in one of two ways:

Method 1. Unique combination of State Code – County Code – Site ID. The site may or may not be identifiable by “Method 2”.

Method 2. Unique combination of Tribal Code – Site ID. If a site can be identified by this method, it can also be identified by “Method 1”. This method is called the “Tribal format”

If users want to select and sort data by Tribal Code and display the information in the Tribal format, they must be in “Tribal mode” for the current session. You can determine if you are in Tribal mode by looking at the blue title bar above the R31 tabs. If the words “Tribal Mode” appear like this, for example,

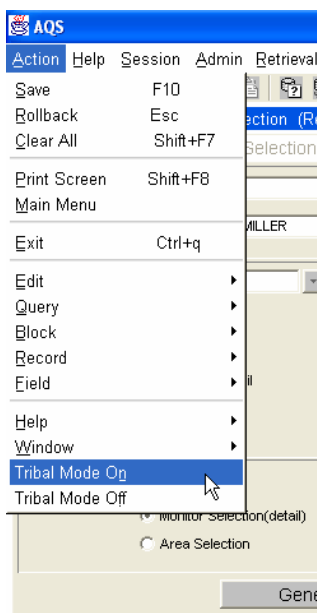


then you are in Tribal mode. If you are not in tribal mode, the title bar will look something like this:



There are 2 ways to set the session to be in Tribal mode:

1. From the “Action” Menu item - This will alter the current session to turn the Tribal mode on or off



2. Update User Profiles – To change the default way your session is set with respect to Tribal mode you may update your user profile record as appropriate. Go to Admin / Security menu items and check or uncheck the “Tribal User” check box on the “User Profile” tab as appropriate. If the user is defined as a tribal user on this screen, they will be put in Tribal mode whenever they sign on to the system. Please note that this mode also applies to other areas of the application, such as the Maintain form modules.

User Profile	Maintain Security	Security Reference Tables	Maintain Roles	User History
First Name JONATHAN Phone 919-541 7738 Zip Code 27711 County Code 063 User ID JNZ Unix Acct aqhqjm00 Fax 9195417738	Initial K Street Address 1 EPA Building City Research Triangle Park User Type H Status Ind P E Mail miller.jonathan@epamail.epa.gov	Last MILLER Street Address 2 Room 335F State Code 37 Agency Code 1108 AQS Contact N EPA Region Code 04 Tribal User <input checked="" type="checkbox"/>		

4.7.4 Creating a Report

The Standard Reports Selection Form is the primary user interface in generating the pre-defined (or standard) reports within the AQS application. Different interface options appear for each report, depending on if the report supports the particular feature.

4.7.4.1 Accessing R31

The R31 form is accessed by selecting the “Standard Report Selection” option from the “Retrieval” menu (see *Figure 4-3* below).

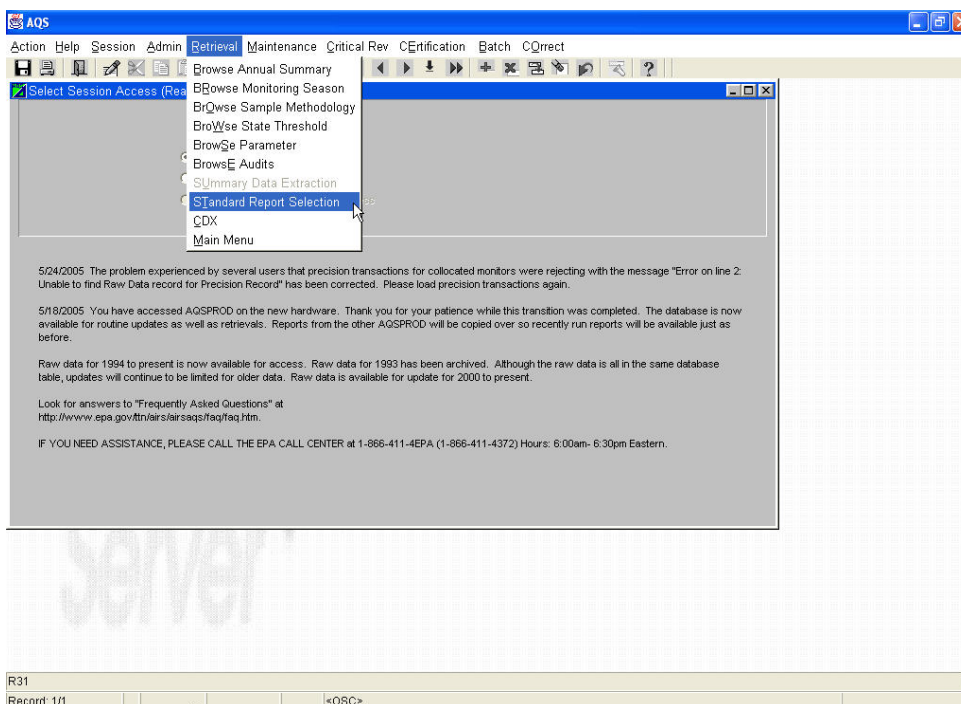


Figure 4-3 – Accessing Standard Reports

4.7.4.2 Criteria Set Tab

When first entering the R31 form, the “Criteria Set” Tab is active and the form is blank. This form will remain blank until either:

- a) The user selects a previously saved “Criteria Set” name from the drop-down list (shown in section “2” in **Figure 2** below). These previously saved criteria sets may be either “Private” criteria sets created by the user or “Public” criteria sets created by another user. Use of this option is covered in Section 3 (“Using Saved Criteria Sets”).
- b) The reports are listed in alphabetical order based on the name of the report. Each report has an associated report code. The user selects a “Report Code” from the drop-down list (shown in section “3” in **Figure 2** below). This indicates that this is a new report being requested. Once the report code is selected, the R31 form is now able to determine the following information:
 - a. What report outputs are available
 - b. What fields may be selected upon
 - c. If any sorting of the selected records is allowed
 - d. What report options are available

Figure 4-4 – Criteria Set Tab

After the desired report is specified, the pertinent parts of the form are populated and the appropriate tabs are activated. The following items are filled out on the “Criteria Set” tab:

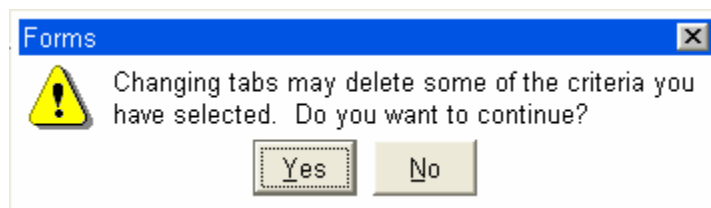
- The report name (Section “3” in *Figure 4-4*)
- The “Run Online” output option is selected by default (Section “3” in *Figure 4-4*). There are three options for how the reports are returned to the user
 - **Run Online** – This option indicates that the results of the report will be returned directly to the screen.
 - **Send via Email** – The results of the report will be sent to the user’s email address as defined in their user profile.
 - **Send to CDX** – The results of the report are sent to your Central Data Exchange (CDX) account. You are responsible for signing on to CDX and downloading the resulting file yourself.
- Depending on what elements are selected, additional windows appear in Section “3” of *Figure 4-4*. For example, if “REPORT” is a valid output type and it is checked, then *Figure 4-4* Section 3 will look like this:

Note the new “Print Format” field. By default it will have Adobe Portable Document Format (PDF) files as the default. PDF is the file format for which the standard formatted reports were designed and is usually the best option. However, the following formats are also available for any formatted report:

- Postscript (PS)
- Hypertext Markup Language (HTML)
- Rich Text Format (RTF)
- HP Printer Language (HPL)
- Plain Text (TXT)

If either the “Send via Email” or “Send to CDX” options are checked, a text field appears for you to optionally specify the name of the file it outputs.

- The appropriate “Report Outputs” available for the report are displayed (Section “3” in *Figure 4-4*). At least one output option will be checked by default.
- The “Monitor Selection (detail)” selection mode will be selected by default (Section “4” in *Figure 4-4*). You may specify your selection criteria by geographic information related to monitor attributes (State – County – Site ID – Parameter Code – POC) or by more general geographic entities (Tribal Areas, State, County, City, EPA Region, etc). You may switch selection modes before executing a query by checking the appropriate radio button in Section “4” in *Figure 4-4*, but the information that you have placed on the “Monitor Selection” tab will not be carried over. You will receive a warning to this effect.



Click on “Yes” to continue to use the other selection mode. Click “No” to stay in your current mode and retain your current information.

- The other appropriate tabs will become active (Section “1” in *Figure 4-4*)

4.7.5 Monitor Selection and Area Selection Tabs

4.7.5.1 Basic Function

You specify your selection criteria either by “Monitor Selection” or by “Area Selection”. Which tab is active is dependant on which radio button is selected on the “Criteria Set” tab (Section “4” in **Figure 2**). The basic functions of these tabs are the same; the only difference is what fields are available in which to specify your selection criteria. The general idea of these tabs is to limit or filter the records that are selected from the database. This is done by specifying geographic, temporal, and / or pollutant information to select only the sites or areas desired. Which fields are available is dependant on the selected report. If a field is not appropriate for the report, it will not appear on the screen.

4.7.5.2 How the Selections Work

As you can see in **Figure 3**, the Monitor Selection tab is broken in to four areas:

- **Site – Monitor Criteria** – Allows selection by the components of the monitor id. Specifically these are the Tribal Code, State Code, County Code, Site ID, Parameter Code, and Parameter Occurrence Code (POC). In addition, you may specify method code, sample duration code, and the effective date range.
- **Global Report Criteria** – Allows selection by a category of parameters (“CRITERIA” category selects all of the criteria pollutant parameters), a single parameter, sample duration, and method code. **NOTE:** If you have specified any of these types of elements in the “Site – Monitor Criteria” section, you will not be allowed to enter them here.
- **Global Data Range** – Allows selection by the appropriate date range specified for the given report. **NOTE:** If you have specified any of the date elements in the “Site – Monitor Criteria” section, you will not be allowed to enter them here.
- **Global Screening Group** – Allows selection by owners of the monitors.

[illegible]

Figure 4-5 – Monitor Selection Tab

The form allows for multiple rows of selections in each category except for “Global Screening Group”. The following rules are enforced when the program builds the query:

- All data entered into a single row within a given category are linked together with “AND” conditions.
- Rows within the same category are linked together with “OR” conditions
- Data between the categories are linked together with “AND” conditions.

In figure 4 below the query would read as follows:

Plain English Version:

“Select Sites in Autauga County (County Code “001”) Alabama (State Code “01”) OR in Norfolk County (County Code “021”) Massachusetts (State Code “25”) AND measuring Criteria pollutants AND operating from January 1, 1999 through December 31, 2000.”

[illegible]

Figure 4-6 – Query Example

Since no filtering criteria were specified on things like Tribal Code, Method Code, Duration Code, or Screening Group, they do not appear in the language of the query. That is to say that what records are retrieved will not be limited by these categories.

4.7.5.3 Differences Between the Selection Tabs

Examine **Figure 5** below. This is the “Area Selection” tab. Conceptually, it works the same way as the Monitor Selection tab shown in **Figure 3** above. The difference between them is what elements you may select. The following chart shows all the available fields and on which tabs they are located. Not all these elements are available with all reports.

Figure 4-7 - Area Selection Tab

Field Name	Monitor Selection	Area Selection	Field Name	Monitor Selection	Area Selection
Tribal Code	✓	✓	Reporting Organization		✓
State Code	✓	✓	Land Use		✓
County Code	✓	✓	Monitor Type		✓
Site Id	✓	✓	Global Pollutant Type	✓	✓
Monitor Single Parameter	✓		Global Single Parameter	✓	✓
POC	✓		Global Method	✓	✓
Monitor Method	✓		Global Duration	✓	✓
Monitor Duration	✓		Global Date Range	✓	✓
Monitor Date	✓		AQCR Code		✓

Range						
City Code		✓		MSA Code		✓
Urban Area Code		✓		EPA Region		✓
CMSA Code		✓		Screening Group	✓	✓

One of the “not so obvious” differences is that the Monitor Selection tab includes Parameter Code, Method Code, Duration Code, and date ranges on each row in the selection criteria. The Area Selection tab does not. The implication is that the Monitor Selection tab allows you to customize what is selected for each monitor whereas this information must be applied to all the geographic records selected from the Area Selection tab. For example, if you wanted 2000 data from Ohio and 2004 data from Virginia, you could only construct this type of a query in the Monitor Selection tab because of the “AND” and “OR” nature of combining the specified criteria. Here is what this query would look like using the “Monitor Selection” tab:

Note that the date range only applies to the other information in the same line. So this would read “Select Sites where the State Code is for Ohio (“39”) and the date range is from 2000-01-01 through 2000-12-31 OR the state code is for Virginia (“51”) and the date range is from 2004-01-01 through 2004-12-31”.

A similar query in the “Area Selection” Mode would look like this:

The “Geographical Criteria” section of the form it would look like this:

The “Date Criteria” section would look like this:

The combination of these two things would read “Select Sites where the State Code is for Ohio (“39”) OR the state code is for Virginia (“51”) AND the date range is from 2000-01-01 through 2000-12-31 OR the date range is from 2004-01-01 through 2004-12-31.” The date range would apply to both geographical entities. There is a similar logic with the single parameter, duration, and sampling methods columns as well.

4.7.5.4 Sort Order Tab

Every report has a defined sort order. Many of the reports allow you to change the sort order in some manner. However, given the structure of some reports, what may be sorted is limited. The interface to alter the sort order can be found on the “Sort Order” tab. If this tab is not active, then sorting is not allowed for the given report.

Sort Order			
Order	Column Name	Allowed Range	
		Lo	Hi
1	PARAMETER_CODE	1	1
2	TRIBAL_CODE	2	3
3	STATE_CODE	2	3
4	COUNTY_CODE	4	8
5	SITE_ID	4	8
6	POC	4	8

Move highlighted column up
 Move highlighted column down

The tab displays the sortable fields, the order in which the sorting will take place, and the range of order the field may appear. In this particular example, the report must be sorted by Parameter Code first (note the Allowed Range is 1). Next you may sort by either:

- Tribal code then State code
- State code then Tribal code

Again, note the allowed order range for these columns. To change the order, highlight the column that you would like to change its order, and then click the “Move highlighted column up” arrow or the “Move highlighted column down” arrow. You may not add or remove columns to the list to be sorted. You may only change the sort order and only within the range where the “Order” number is between the “Lo” and “Hi” values of the “Allowed Range”.

4.7.5.5 Report Options Tab

With all the reports, there are several options that may be available that will effect what data is returned to the user. The report options may be placed into one of three categories:

- Single value report options (See *Figure 4-8*) – For a given option category, the user may select one of a known list of options. All available options appear in the drop-down listing for the option.
- Alternate standards report option (See *Figure 4-8*) – User may specify the values at which a given value will be marked as exceeding a given limit. In order to use this option, the data must be returned in Standard Units. These alternate limits will only be applied where the data being retrieved matches a given parameter and duration. The user must specify a parameter, duration, and any of the following:
 - Primary Value
 - Secondary Value

- Primary and Secondary Value
- Multiple value report options (See *Figure 4-8*) – For a given option category, the user may select none, one, or multiple choices from the known list of options. Selections are made by checking the box to the right of the option. A checked box indicates that the option will be applied to the report. The user may also utilize the “Check All” and “Uncheck All” buttons to expedite selecting multiple columns.

Standard Report Criteria Selection (Read Only) AMP350 Tribal Mode

Criteria Set | Monitor Selection | Area Selection | Sort Order | **Report Options** | Retrieve Reports

INCLUDE NULLS ☒ YES

DAILY STATISTICS ☒ MAXIMUM

UNITS ☒ STANDARD

RAW DATA EVENTS ☒ INCLUDE EVENTS

MERGE PDF FILES ☒ NO

Single Value Report Options

ALTERNATE STANDARDS

Parameter	Duration	Primary Std	Secondary Std

Alternate Standards Report Option

Generate Report

Figure 4-8 - Single Value & Alternate Standards Report Options

Figure 4-9 - Multiple Value Report Options

4.7.5.5.1 Merge PDF Files Option

A common report option is one labeled “MERGE PDF FILES”. It lists either “YES” or “NO” as the available option values. If this option equals “YES”, the report program will merge the results of the cover sheet with the output of the formatted PDF report. This option will only be implemented if **ALL** of the following conditions are true:

1. The “MERGE PDF FILES” option = “YES”
2. The user has selected a “REPORT” type of output from the “Criteria Set” tab
3. The format of the “REPORT” output on the “Criteria Set” tab is set to “PDF”

The option screen does not validate that the combination of these elements before executing.

4.7.5.5.2 Exceptional Event Processing

Several reports have an option of how to handle exceptional event processing. This option will primarily affect summary types of reports. When data is submitted to AQS, the submitting agency may flag the data as being effected by either natural events or man-made exceptional events that have influenced the level of the sample. These flags are eventually concurred or not concurred by the local EPA authority as to whether this is an approvable event.

When AQS summarizes the data, it is summarized multiple times if the dataset contains any of these natural or exceptional events. The following summaries are computed:

- Include all data whether or not they contain events
- Exclude all events
- Exclude just the exceptional events

- Exclude just the natural events
- Exclude any events with EPA Regional concurrence
- Exclude just the exceptional events with EPA Regional concurrence
- Exclude just the natural events with EPA Regional concurrence

4.7.6 Saving Criteria Sets

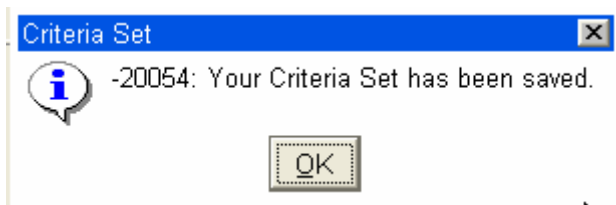
Once you have successfully created a criteria set, you may save it to be executed again at a later time. To save a criteria set, first go to the “Criteria Set” tab (See section 2 of *Figure 4-4*). Enter the following information:

- Criteria Set Name: A unique name to identify the criteria set
- Criteria Set Description: A brief description of the criteria set
- Owner: This will be your name and filled out automatically
- Type: You can either define the criteria set as “Private” (default) or “Public”
 - *Private*: This option means that only you may access and update this criteria set
 - *Public*: This option allows any other user to access and update the criteria set

Once you have filled out the appropriate information, click on the “Save” icon in the upper left-hand corner of the form.



If you have successfully completed these steps, you will receive the following dialog box:



4.7.6.1 Using Saved Criteria Sets

After entering the Standard Reports form (See section 2.2.2 for information on how to enter the R31 form), you may recall any previously saved criteria sets. You will be able to see any criteria set that you have saved as well as any other criteria set saved by others labeled “Public”.

To see all the criteria sets you have in your private account, select “Private” from the “Type” field and click on the “Criteria Set” drop-down list. To see the criteria sets available in the “Public” area, choose “Public” from the “Type” field and click on the “Criteria Set” drop-down list.

The report that the criteria set was originally run with is returned. Any selections made on the Monitor / Area Selection tab, Sort Orders, and Report Options are also returned. However, the elements under the outputs are always reset to the default values for the report (see section “3” of *Figure 4-4*). Once the information has been loaded into the form, the report may be immediately generated or you may make any changes.

4.7.6.2 Deleting Saved Criteria Sets

You have the ability to delete previously saved criteria sets that you no longer need or want in your list of saved criteria set. Since these saved criteria sets are saved within the database, they are treated like any other record in the database. The method of deleting them is:


1. Query the Criteria Set into the form.
2. Delete the record using either the form icon or the menu selections.

4.7.6.3 Query the Criteria Set into the Form

To see all the criteria sets you have in your private account, select “Private” from the “Type” field and click on the “Criteria Set” drop-down list. To see the criteria sets available in the “Public” area, choose “Public” from the “Type” field and click on the “Criteria Set” drop-down list. You may delete only “Public” criteria sets that you have saved.

4.7.6.4 Delete the Criteria Set

Once the criteria set have been queried, you may delete the record by any of the following methods:

1. Click on the “Remove Record” icon 
2. Select “Action” → “Record” → “Remove” from the menus.
3. Press the “Shift” key and the “F6” key simultaneously.

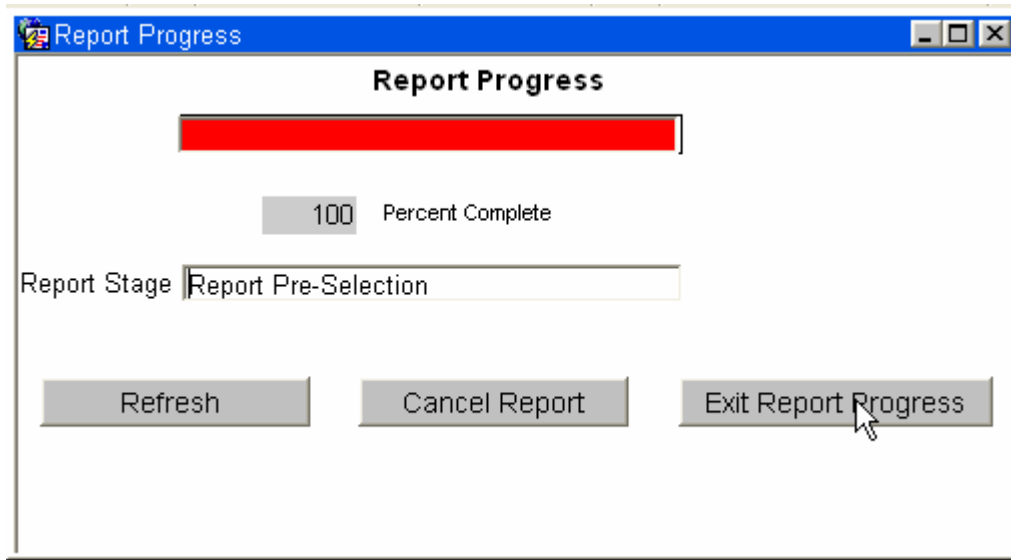
Please note that once the record is deleted, the action is automatically committed and cannot be un-done.

4.7.7 Generate Report



At the bottom of each tab of the R31 form is the “Generate Report” button. Once this button is pressed, the report takes the information from the tabs of the R31 form and uses it to generate the report. If the “Send via Email” or “Send to CDX” options were selected from the “Criteria Set” tab, the report runs in the background. When complete, the report will be delivered by the selected mechanism. If the “Run Online” option was selected from the “Criteria Set” tab, then a progress dialog box appears to let the user know the progress of the report. When complete, the progress dialog box will disappear and the report output will be delivered to the user on the screen. The “Generate Report” may be pressed at any point during the selection criteria process. Prior to submitting the report, the R31 form will check to ensure that all required information has been provided. If it has not, the user will be shown the part of the form in error and provided with a message to indicate what additional information is needed.

4.7.7.1 Report Progress Dialog Box



The Report Progress dialog box provides the user with the following information:

- The current stage of the report. When a report is being generated, it will undergo a series of different steps. While not all reports take the same steps in generating a report, the final stage of the report generation process is the “Generating Output” stage.
- The percent completeness of the particular stage. This provides an estimate of the amount of progress made from the particular stage. It is not an overall percentage to generate the entire report. This percent completeness applies only to the current stage.
- The information on the dialog box automatically refreshes every 15 seconds. If you would like the information to refresh before the next 15 second interval, press the “Refresh” button and the information will be updated.
- The “Cancel Report” button will tell the report generator to cancel the currently running report. The cancellation is not immediate. A message must be sent to the report server, and the dialog will wait until it receives a response that the report has been cancelled.
- The “Exit Report Progress” button will not cancel the report, but it will take it out of the “Run Online” mode. In order to see the results of the report, the user will have to manually check the progress of the report through the “Retrieve Reports” tab (See section 4.2).

4.7.8 Retrieving Previously Executed Reports

You may also obtain the results of a previously run report by clicking on the “Retrieve Reports” tab from the R31 form (See **Figure 8** below).

User Id	Report Code	Request Type	Request Date	Report Stage	% Complete
JNZ	AMP450	REPORT	05/27/2005 01:28 PM	Completed	100
JNZ	AMP350	REPORT	05/27/2005 12:43 PM	Cancelled	100
JNZ	AMP350	REPORT	05/27/2005 12:42 PM		
JNZ	AMP230	REPORT	05/25/2005 02:09 PM	Completed	100
JNZ	AMP450NC	REPORT	05/24/2005 03:12 PM	Completed	100
JNZ	AMP450NC	REPORT	05/24/2005 03:08 PM	Completed	100
JNZ	AMP500	REPORT	05/20/2005 08:54 AM	Completed	100
JNZ	AMP350	BATCH	05/13/2005 09:47 AM	Cancelled	100
JNZ	AMP410	REPORT	05/13/2005 09:45 AM	Cancelled	100

Retrieve Report Refresh Query Cancel Report Delete Report

Figure 4-10 - Retrieve Reports Tab

The “Retrieve Reports” tab shows the status of any report that you have run in the last 15 calendar days. It shows the following information:

- Who ran the report (will always be your user ID)
- What report was run
- How they requested the report (Online or Batch)
- The date the report request was made
- The stage of the report
- Percent completeness of the stage

4.7.8.1 Retrieve Report Button

The “Retrieve Report” button on the “Retrieve Reports” tab (see **Figure 4-10**) will obtain the results of a completed report for the row that is highlighted on the form. The button will only work successfully if the Stage is “Completed” and the “% Complete” column = 100. Keep in mind that this function returns the results of the report at the time it was originally run. It does not re-execute the query. So any updates to the data that have been made from the time the report was originally run will not be reflected in the retrieved report.

4.7.8.2 Refresh Query Button

The “Refresh Query” button updates the “Stage” and “% Complete” columns for the reports that you have supplied. The results are refreshed each time you reopen the

“Retrieve Reports” tab, but if you want to see the status as it stands at this moment, press this button

4.7.8.3 Cancel Report

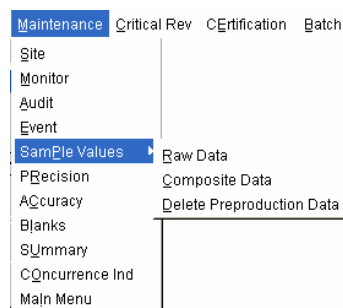
The “Cancel Report” is used when you would like to cancel a report that you are running in the background. It will not delete the report from the list of reports. It only changes the status of the highlighted row to “Cancelled”.

4.7.8.4 Delete Report

The “Delete Report” is used when you would like to remove a report from the list of reports run in the last 15 days. It will not cancel the report. It only removes the highlighted row from the list of reports for the user.

4.8 Maintenance – Reviewing, Editing, and Creating Data

The Maintenance function allows you to browse and edit the data on-line. The Maintain function uses the standard Oracle query icons and principals to view the data. However, not all of the functions are available all of the time. Maintain is one of the menu functions that will actually change the menu structure. When you click on “Maintenance”, you will need to choose what kind of data you would like to see (see the menu sample above). Once you choose the type of data, the menu bar will change to the following:



Action Help Site Monitor Audit Event Sample Values Precision Accuracy Blanks Summary Concurrent Ind Main Menu

So the items that now appear on the list are nearly the same as the displayed list from the main menu. It is just a quick way to get to the other types of data that are available.

4.8.1 Working as “Read Only” vs. with a “Screening Group”

How “Maintain” will work for you depends greatly on how you established your session when you signed on to AQS.

- **Read Only User** - This will allow you to view any data in AQS that is classified as “Production Ready”. You will not be allowed to change any of the data that you see (even if it is your own).
- **Screening Group Access** – This mode will allow you to query, view, and edit only the data that you own for the screening group that you selected. However, you will get to see any of the data that you own (“Production” and “Pre-Production data”).

So the question becomes, “what do you want to see?”, or “what do you want to do with the data?”

4.8.2 Types of Data Available

right corner the “Create Monitor” button. It is grayed out in this example because we are in “Read Only” mode and cannot alter information in the database. However, if we did just create a site on-line, you could press this button to begin the process of creating a monitor for the site.

4.8.2.1 Site Information

Site information contains all of the data that pertains to *where* a monitoring site is located. You will notice that there are multiple tabs that may be selected. Each of the tabs will show you additional information for the site that is displayed on the “Basic Site Data” tab. You will notice in the lower

4.8.2.2 Monitor Information

The Monitor form provides information about the configuration of a monitor at a site. As with the site form, the monitor form has multiple tabs associated with it; each containing additional information about the monitor that is on the “Monitor Basic” tab. In fact, there are so many additional tabs, sometimes the labels get cut off. To see the name of the label on a tab,

just place your mouse pointer over the tab and the name will appear (see the “Sample P...” tab with the “Sample Periods” text as an example).

4.8.2.3 Raw Data

As mentioned far too many times within this guide, there is more raw data in the system than any other type of data. In fact, 99.98% of all the data in AQS is raw data. These are the hour-by-hour measurements obtained from the monitoring stations. As you can see, every data point has information about the instrumentation used to collect the

data, any qualifiers associated with a data point and any comments submitted by the user. Due to the number of records in the table, it is a very good idea to be as specific as possible when constructing your query.

4.8.2.4 Precision Data

Precision data reflects the results of the required precision audits from the air monitoring program. These are the individual audit results. There are other areas and reports within AQS which take these individual audit results and summarize them on a per site and per PQAO (Primary Quality Assurance Organization) basis.

4.8.2.5 Accuracy Data

Accuracy data reflects the results of the required precision audits from the air monitoring program. These are the individual audit results. There are other areas and reports within AQS which take these individual audit results and summarize them on a per site and per PQAO (Primary Quality Assurance Organization) basis.

4.8.2.6 Blanks

Blanks data are used to detect any contamination which a monitoring filter may have encountered prior to being inserted into the instrument. There are no reports or summaries of the blanks data, so if you want to see it, this may be your only method of obtaining this data. You may notice that the format of this data is very similar to the raw data form.

4.8.2.7 Summary

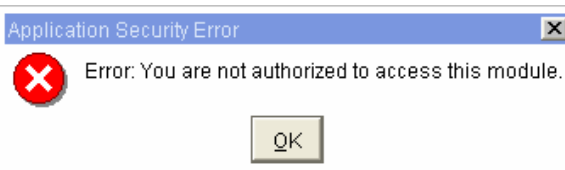
Although you can, technically, report the annual summary data to AQS, most users submit the raw data and let AQS perform the calculations to create the annual summary data. All pollutants have similar statistics including the number of observations, average, minimum value, and top 10 maximum values. If there the regulations specify a special statistic to be calculated for a particular pollutant, it will also appear in this table.

4.8.2.8 Audit

The “Audit” table contains data about technical system audits and any of the findings that an auditor may have found. You need special permission to enter this kind of information, but anyone should be able to get information on an audit that has been performed.

4.8.2.9 Event

The Event module is not available to most users. So if you do try to access it, you will very likely get the following message:



4.8.3 Executing a Query

The premise of all the forms in the database is that you want to get all of the information possible. However, keep in mind that AQS is HUGE! So you actually want to be as specific as possible when querying the data. All of the forms work essentially the same way. The only difference is that the number of fields that you can filter by changes. The data is returned to you in *descending* date order (the most recent data is shown at the beginning of the list). So we will take an example of one of the more comprehensive forms and you can apply the same principals to the other forms.

STEP 1: Let the system know you want to enter a query

When you first enter a form, you are automatically in “Enter Query” mode. You can verify this by looking at the bottom information bar on the screen:




You may also invoke the “Enter Query” mode by pressing the “Enter Query” icon (🔍) or pressing “F7”.

STEP 2: Enter the filter criteria

In general, you can specify any of the fields that appear in the top block of the form, but not in any of the fields on the lower blocks of a form. If a form has multiple rows and no top block (like the “Audit” form), then you can specify the filters in the first row of the form.

STEP 3: Execute the query

Press the “Execute Query” icon () or hit “F8”. The form will query in the data that meets the filter conditions that you specified. When you do, the results of the query will be returned to your screen

4.9 Batch Processing – Working with Large Amounts of Data

So now you know what kind of data that you have, you know how to look at it one record at a time (through “Maintenance”), many records at once (through the “Reports”), add one record at a time (also through “Maintenance”), and so guess what is next... adding large volumes of data to the database through a batch process. The batch process is all about moving data in a known format from a file into AQS. So what does that tell us? Well, if we are dealing with files, we can assume that CDX will be involved somehow. And since we are updating data in the database we will need to have access to a screening group. What we don’t know at this point is what do we mean by “known format”? Read on to the next section! If you already know how to format the data, skip the next section and go on to section “4.9.2 About the Batch Process”.

4.9.1 Formatting AQS Data

By having data organized in a known and consistent manner, it allows you to tell AQS what type of data you have and what you would like to do with that data. Each type of data will have its own format. At this time, AQS allows for each of the data types to be formatted in one of two ways: by a pipe-delimited text format or by following the AQS XML schema.

4.9.1.1 Pipe-Delimited Text Format

Using the pipe-delimited format is by far the most common method of setting up the data for batch processing. Processing the data in this manner makes the following assumptions:

1. Each type of data will have its own format. To date, there are 20 different types of data in AQS (Not coincidentally, there are 24 different types of forms on the Maintenance screens... one for each type of data – Not quite a 1-to-1 mapping, but close!).
2. The type of data that you are working with is specified in the first field
3. You tell AQS that you are done with the field by placing a pipe (“|”) symbol between the fields

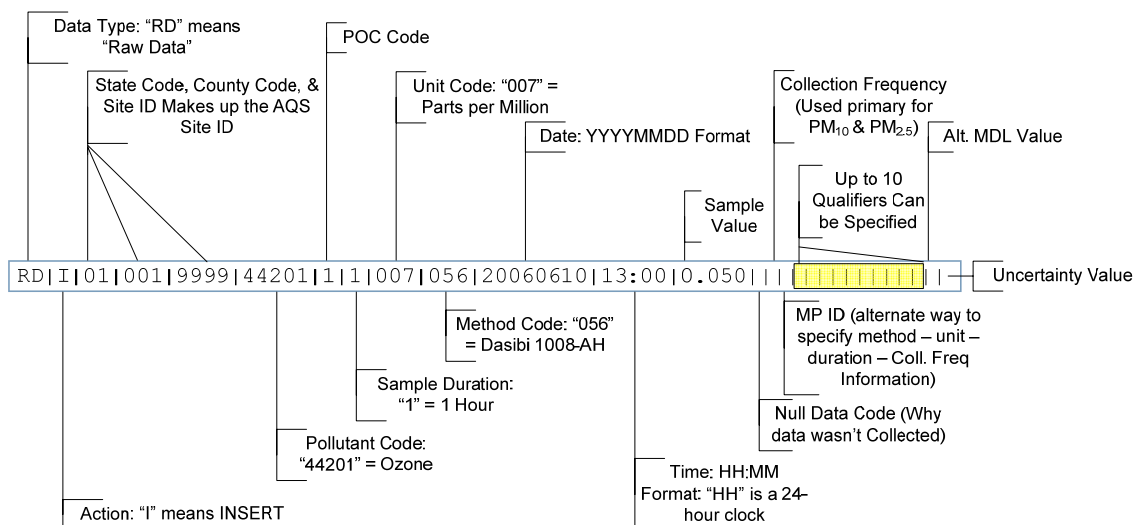
The formats for each of the record types can be found at the following web address: [http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS Input Transaction Formats.pdf](http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS%20Input%20Transaction%20Formats.pdf). In fact, if you don’t have a copy of this sitting at your desk, you should probably get one before we do the example. Are you ready for an example? Me too... Let’s say that you know the following information about a raw data point that you want to enter into AQS:

- AQS Site ID: 01-001-9999
- Pollutant Measured: Ozone
- POC (assigned as part of the monitor ID): 1
- Does this value already exist in the system? NO
- How long did it take to form the sample (the duration): 1 hour
- What kind of instrument was used? Dasibi 1008-AH
- When was the sample collected? June 10, 2006
- What time did the sample begin (local standard time): 1:00 PM
- Sample Concentration: 0.050 parts per million
- Any other qualifiers that you want to apply to the data? No
- Would you like to specify an alternate Minimum Detection Limit for this sampler? NO
- Would you like to specify an uncertainty value with this sample? NO

OK... The resulting transaction would look like this:

```
RD|I|01|001|9999|44201|1|1|007|056|20060610|13:00|0.050| |||||
```

Looking at it field-by-field, here’s what we have:



So where did I get all of these codes? Some, you can find within the application (like the pollutant, method, unit, and duration codes). Others can be found on the AQS page of the TTN

4.9.1.2 XML Format

XML stands for "Extensible Markup Language". It provides a structure defined by an *XML Schema* in order to allow other programs to do something with the data. All values for fields are enclosed within tags that look like HTML tags. In this particular case, the XML Schema tells AQS how to load data into the database. If you look at *Figure 4-11*, you can see the hierarchical structure of the AQS XML schema.

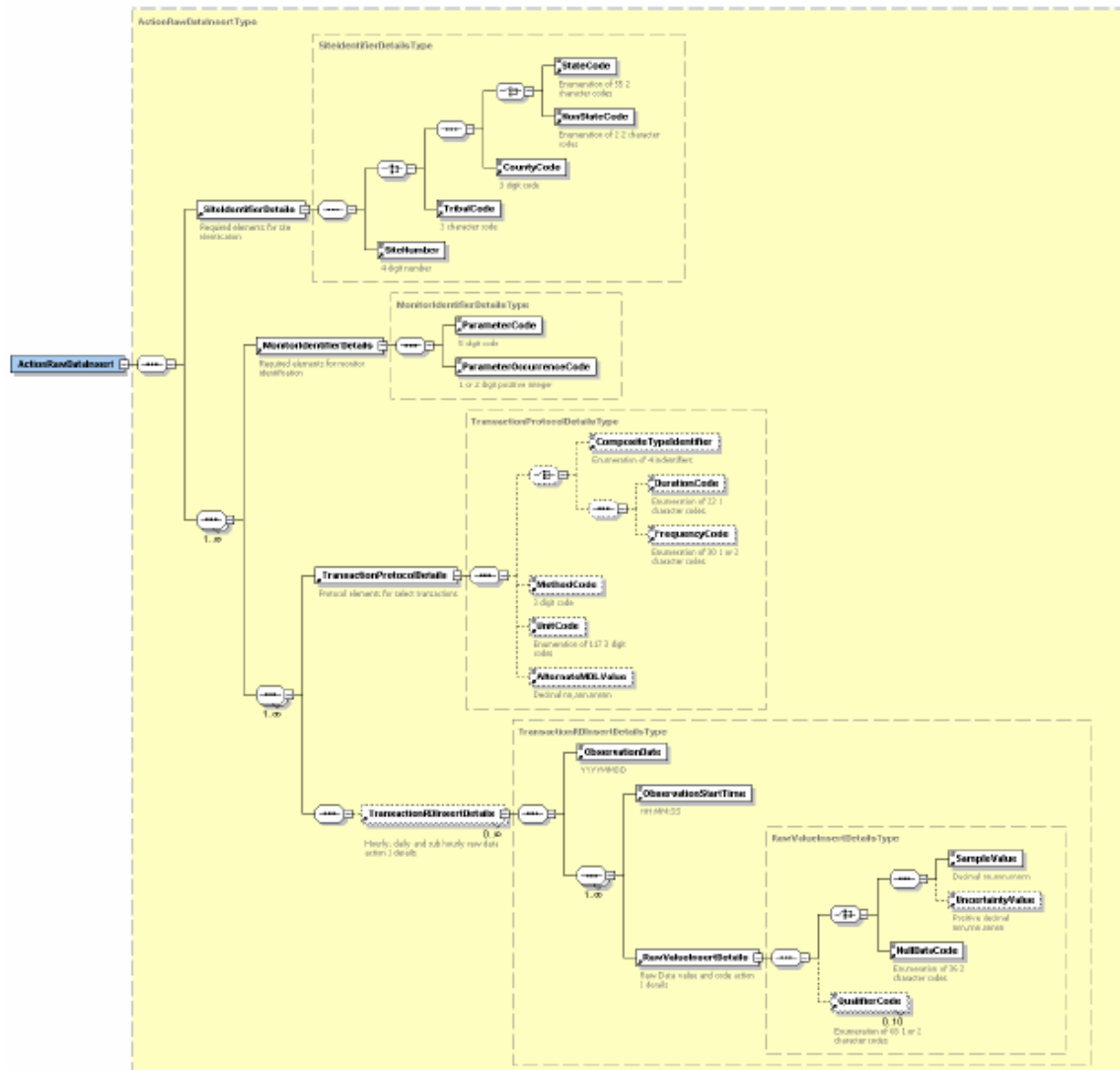


Figure 4-11

So if we take the same example as we used for what the data would look like in “Pipe-Delimited” format and apply the AQS XML schema to it, it would look quite different, but convey the same information. Again, here is the information:

- AQS Site ID: 01-001-9999
- Pollutant Measured: Ozone
- POC (assigned as part of the monitor ID): 1
- Does this value already exist in the system? NO
- How long did it take to form the sample (the duration): 1 hour
- What kind of instrument was used? Dasibi 1008-AH
- When was the sample collected? June 10, 2006
- What time did the sample begin (local standard time): 1:00 PM
- Sample Concentration: 0.050 parts per million
- Any other qualifiers that you want to apply to the data? No

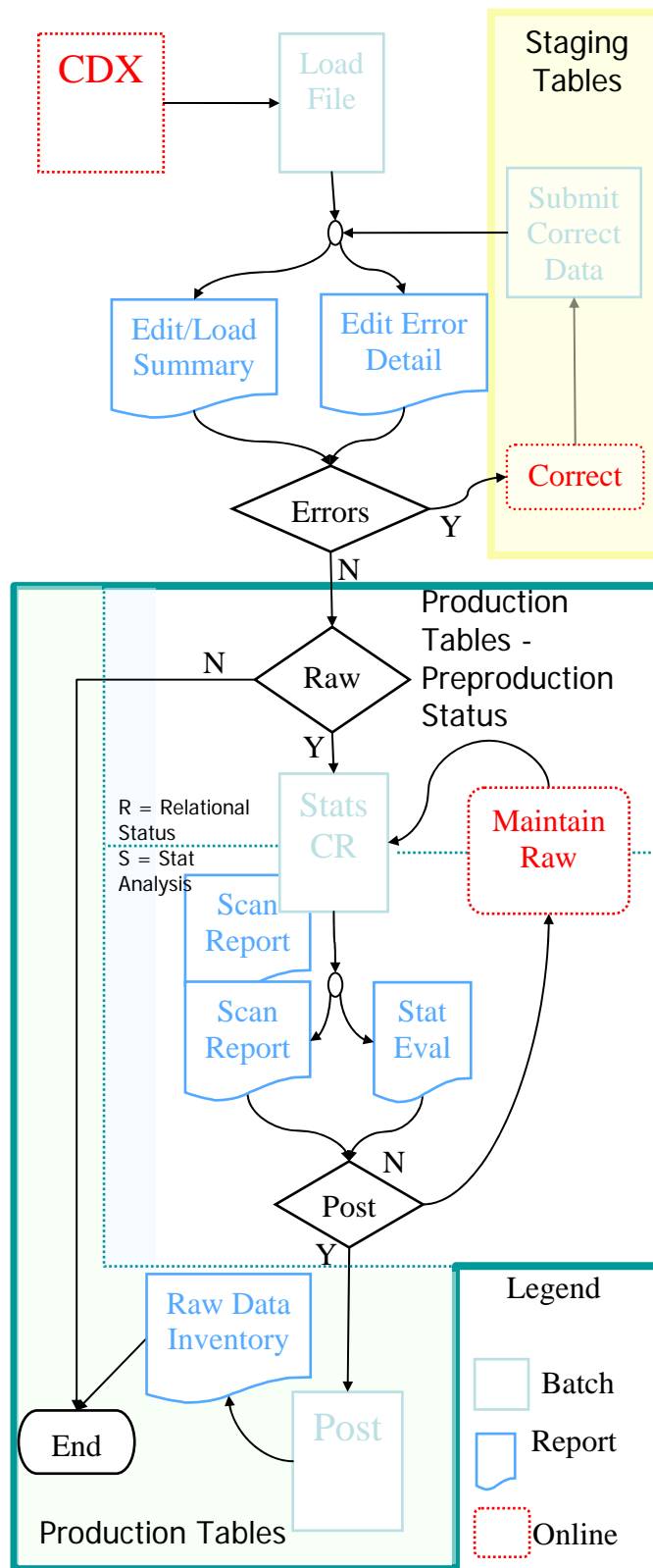
- Would you like to specify an alternate Minimum Detection Limit for this sampler? NO
- Would you like to specify an uncertainty value with this sample? NO

And here is what this information would look like in the AQS XML format:

```
<ActionRawDataInsert>
  <SiteIdentifierDetails>
    <StateCode>01</StateCode>
    <CountyCode>001</CountyCode>
    <SiteIdentifier>9999</SiteIdentifier>
  </SiteIdentifierDetails>
  <MonitorIdentifierDetails>
    <ParameterCode>44201</ParameterCode>
    <ParameterOccurrenceCode>1</ParameterOccurrenceCode>
  </MonitorIdentifierDetails>
  <TransactionProtocolDetails>
    <DurationCode>1</DurationCode>
    <MethodCode>059</MethodCode>
    <UnitCode>007</UnitCode>
  </TransactionProtocolDetails>
  <TransactionRDInsertDetails>
    <ObservationDate>20060610</ObservationDate>
    <ObservationStartTime>13:00</ObservationStartTime>
    <RawValueInsertDetails>
      <SampleValue>0.050</SampleValue>
    </RawValueInsertDetails>
  </TransactionRDInsertDetails>
</ActionRawDataInsert>
```

You might notice a couple of things. For starters, this format takes a lot more characters to convey the information for a single record. However, over time, you really start saving space because you don't have to repeat things (like the "SiteIdentifierDetails") until the values change (you move on to the next site for example). The other thing that you might notice is that the file is self-documenting. I don't need to tell you what each field means because the enclosing tags tell you what that value represents.

The overall moral to the story is that it doesn't really matter which format you use. They both do the job they are should do; they tell AQS about their data and provide instructions as to what to do.



4.9.2 About the Batch Process

Now we know that AQS needs to know about the data that you have and what do with that data. You do that by formatting the data in a way that AQS can recognize. So you have a file sitting on your PC at your office with lots and lots of data collected from your monitoring sites. What do you do now? That is where the diagram to the left comes into play. This provides a picture of how to process your data through the system. Each of the square boxes represents a process that you can initiate through the “Batch” menu item within the AQS application. Each of the light blue objects () represent a report that you can request through the batch screen as well. The red rounded-square objects represents other processes in the application which we’ve already covered.

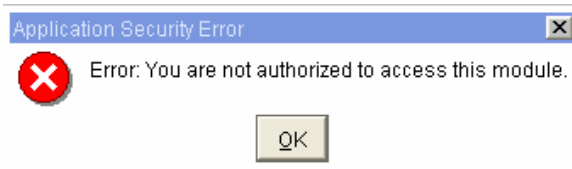
There are a few things worth noting in this diagram:

- Although there are three processes listed (Load, Stat / CR, and Post), only raw data types of data need the Stat / CR and Post steps. All other data types go straight into “Production” status.
- The Raw data can have up to 3 different statuses, depending where in the process it is:
 - R = Loaded successfully
 - S = Passed statistical evaluation
 - P = Production status. This means that the data is accessible to be

read by anyone in the system.

- If data is identified as having errors, the records are sent to the “Staging Tables”

In order to load data into the database through the batch process, you have to have access to a screening group and you have to have “Update” authority within that screening group. If both of these are not met, then you will get the following error message when you click on the “Batch” menu item:



No need to panic! Just go back to “Sessions” and select a screening group for which you have update authority and try again.

Once you have successfully selected a screening group and select the “Batch” button, you will be brought to the Batch form.

Figure 4-12

This form is broken down into 3 basic areas (working from top to bottom):

- 1) List of the files that you have transferred to CDX
- 2) List of processes that have been performed within this screening group recently (within the last 2 weeks)
- 3) The buttons that activate either a process or starts a report

Since the other two sections are populated by using the buttons in the “Available Actions” section of the form, it is probably a good idea to review what the different functions are:

- **CDX:** Clicking this button will send you to the CDX Home Page (remember it is a different application). Once you transfer the file from your PC via CDX (see Section 3 if you have questions on how to do this), you will see the file appear in the “List of Files Available from CDX” portion of the form.
- **Load File:** The Load File process will attempt to enter the records in the file to the AQS Database. The data is verified that it meets all the business rules necessary. If at least one error in the file is found,

the row with a “Job Type” of “FILE” in the “List of Processes Recently Performed” will have a session status of “ERROR”. Additionally, the records with errors are copied to the appropriate “Staging Table”, where you will be able to make modification to the record through the “Correct” process. If no errors are found, the row in the “List of Processes Recently Performed” will have a session status of “COMPLETED”. Also, the data is entered into the appropriate AQS Database table. If this is Raw Data (“RC” or “RD” transactions), then the data is entered with a status of “R” meaning that it has passed all of the database rules but still needs to be verified through other processes. All other data types are entered with a “P” status (“P” status means “Production Ready”).

- **Submit Correct Data:** This process load data from the “Staging Tables” rather than from a file you transfer from CDX. All the other information mentioned in the “Load” function is identical for this function except that the data comes from a different source.
- **Stat / CR:** This process will perform a statistical (the “Stat” part of the name) and identify any data anomalies that fail a “Critical Review” (the “CR” part of the name) analysis on all the data that is trying to be processed in the system. In this step, the status of the data is changed from “R” to “S” meaning that the data has been subjected to statistical evaluation. **This process only applies to Raw Data.**
- **Post:** This process will change the raw data in the database for the screening group from a status of “S” to “P”. When you press the “Post” button, you will be taken to a screen that looks like this:

Review Statistical Data (Improve) Tribal Mode

Raw Overview Raw Data

Monitor ID	Year - Quarter	CR Exists	Stats Exist
17-019-9000-85101-1	2002-1	N	N
17-019-9000-85101-1	2002-2	N	N
17-019-9000-85101-1	2002-3	N	N
17-019-9000-85101-1	2002-4	N	N
17-019-9000-88111-1	2002-1	N	N
17-019-9000-88111-1	2002-2	N	N
17-019-9000-88111-1	2002-3	N	N
17-019-9000-88111-1	2002-4	N	N
36-109-9000-88403-1	2002-1	N	N
36-109-9000-88403-1	2002-2	N	N
36-109-9000-88403-1	2002-3	N	N
36-109-9000-88403-1	2002-4	N	N

Post Data to Production
Return to Batch Processing

Critical Review Raw Data

Action	Std Samp	Samp	Comp Samp	Comparison	Error
Ind	Value	Begin Date	Value	Date	Desc

Statistical Data

Total Gap	Value Above Gap	Num Below Gap	Error Date	Statistical Error

The intent is to provide the user with one last change to approve or to not approve making this data available to the entire user community. So if you press the “Post Data to Production” button

at this point, the job is submitted. **This process only applies to Raw Data.**

- Edit Load Summary: This process will produce a report that describes how many records were successfully processed by a LOAD job. You can only perform this function for “FILE” job types.
- Edit Error Details: This process will produce a report that will list all errors found by the loading of the data. You can only perform this function for “FILE” job types.
- Scan Report: This process will produce statistics about data that you are trying to make production. You can only perform this function for “STATCR” job types. **This process only applies to Raw Data.**
- Stat Evaluation: This process will produce a report about any statistical errors found during the “Stats CR” Job. You can only perform this function for “STATCR” job types. **This process only applies to Raw Data.**
- Raw Data Inventory: This process will produce a report with the number of data points that were processed during a POST process. You can only perform this function for “POST” job types. **This process only applies to Raw Data.**

4.9.3 Batch - When Things Go Right

In a perfect world, none of the records in your files will have errors when you process it. If this is true, then things go very smoothly with the batch process. If you follow along with the flow chart at the beginning of this section, you can see what I mean. We will take two scenarios: First we’ll look at the easiest case where the file contains no raw data (it has all precision and accuracy audits for example. Then we will look at what happens in a “best case” scenario for when a file does have raw data.

4.9.3.1 Clean File Without Raw Data

- Click on the CDX button
- Transfer your file
- Close CDX – This should leave you with the AQS Application open
- Click on the “Refresh” button
- Click on the “Load File” button. You will be told the job was submitted and a session record will appear with a “Job Type” of “FILE” and a “Session Status” of “ACTIVE”
- Wait for “Session Status” of the session record to change to “COMPLETED”

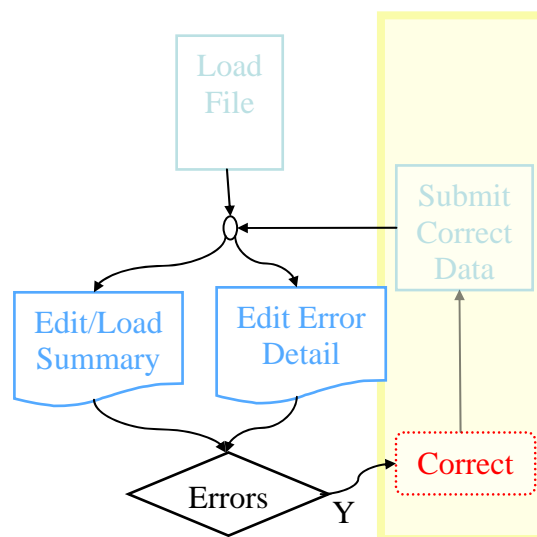
4.9.3.2 Clean File With Raw Data

- Click on the CDX button
- Transfer your file
- Close CDX – This should leave you with the AQS Application open
- Click on the “Refresh” button
- Click on the “Load File” button. You will be told the job was submitted and a session record will appear with a “Job Type” of “FILE” and a “Session Status” of “ACTIVE”

- Wait for “Session Status” of the session record to change to “COMPLETED”
- Click on the “Stat / CR” button. A session record will be created with a “Job Type” of “STATCR” and a “Session Status” of “ACTIVE”
- Although it isn’t required, it is a good idea to review the reports of the information generated by the “Stat / CR” analysis. So click on the “Scan” and / or “Stat Evaluation” buttons to generate the reports.
- Wait for “Session Status” of the session record to change to “COMPLETED”
- Click on the “POST” button. You will be taken to a screen with all the monitor-month’s data displayed.
- Click on the “Post Data to Production” button. A message will appear saying the job was submitted
- Click on the “Return to Batch Processing” button. A session record will be created with a “Job Type” of “POST” and a “Session Status” of “ACTIVE”
- Wait for “Session Status” of the session record to change to “COMPLETED”

4.9.4 Batch – When Things Go Wrong

Well, the world isn’t perfect. You will very likely have some errors in your files. It is estimated that 33% of all the files submitted to AQS have some error associated with it. So it would be good to know what to do when this happens, eh?!? Again, refer to the flow diagram at the beginning of this session. Many of the steps that are performed are identical when things go wrong. The biggest difference is that if there are errors, the records are placed in *staging tables* until the errors are fixed. There are 20 different types of staging tables; one for each type of transaction available in the system. You use the **CORRECT** function to correct the errors in the staging tables. Once you have changed the records in **CORRECT**, you then try to load them again by pressing the “Submit Correct Data” button. This tells the system to load the data from the staging tables rather than from a file. Just like when loading from a file, the system will test the records against all of the rules in the AQS database. If they pass all the checks, they are placed in their proper tables. If they don’t pass, they are sent back to the staging table to be corrected again. You continue this process until all the errors are addressed. Once your records pass the edits, you proceed on with the process as outlined when things go right. Now the \$1,000,000 question is “How do I use CORRECT?” Good question! Read on!



CORRECT

Site Data	▶
Monitor Data	▶
Raw	
Precision	
Accuracy	
Blanks	
Composite	
Annual Summary	
Delete by Screening Group	
Main Menu	

4.10 Working with CORRECT

The Correct function is a bit of a misnomer. It doesn’t actually correct the data... you correct the data. The Correct function merely provides a mechanism for you to edit the data in the staging tables. As mentioned earlier, there are 20 different forms that make up the correct function; one form for each type of data available to be submitted into

AQS. Each form works in nearly identical ways. So we will look at one or two examples and leave you safe in the knowledge that other forms work the same way. But before we do that, notice that the menu bar has changed once you click on “Correct” from the main menu:

Action Help Site Data Monitor Data Raw Precision Accuracy Blanks Composite Annual Summary Batch Main Menu

The menu had changed to give you quick access to each of the different data types available through Correct. To get back to the main menu, click on the “Main Menu” item (on the far right).

NOTE: Since we are working with data that you are trying to update, you will need to select a screening group before you will be allowed to access the Correct module

Here is the Raw Data Correct form:

The Records in Error

Errors Associated with the Row with Focus

As you can see, you may have a lot of errors. Each error will have one or more errors associated with it. The way you query in records is exactly the same as it is for the “Maintenance” forms (See section 4.8.4 - *Executing a Query* for more information on how to execute queries).

The basic premise of what you do in Correct is simple:

- Find the type of data that you need to correct
- Query in the records that you want to look at
- Make the necessary changes
- Save (or Commit) those changes
- Go back to the “Batch” menu item
- Press the “Submit Corrected Data” button


But sometimes you will have hundreds (or even thousands of records that you want to make the same changes to. Do you have to change each one by hand one at a time? No!

That is where some of the other tools available to Correct come into play. All of the tools that are mentioned in section 4.3.3.4 (*Oracle Form Functions – Record*) work exactly the same here. There is one function that is unique to Correct: Search & Replace.

4.10.1 Search and Replace



We have all used a “Search and Replace” function (we’ll call it “S&R” for short) in a word processor or spreadsheet, right? You look for some text and you want to replace it with some other text. Well, the S&R in Correct works a little differently. For this program, S&R will change **any** value that currently exists in a column to the specified value. So the proper way to do a search and replace is as follows:

- Query in records that have a value that you would like to replace
- Place your cursor on the column where you would like to replace the value
- Click on the S&R Icon
()
- Fill out the “New Value” field to be the “Replace” value

Although the form will show you the “Current Value” on the form, it will actually change the value of any record *currently queried* into the form.

4.10.2 Delete All Selected

Another button that appears below the records in the given staging table is the “Delete All Selected” button. This button will delete all records currently queried into the form. This is a great way to get rid of records that you no longer want rather than deleting them one at a time using the buttons.

4.10.3 Delete by Screening Group

The last item on the Correct menu is “Delete by Screening Group”. Let’s say that things have just turned into a complete mess and you just want to start over. That is where this function comes into play. It will delete any record that your screening group owns in any of the staging tables. Keep in mind that it will only delete items in the staging tables. It will not delete data that may be “pre-production” in the database tables. Only one person per screening group has the authority to use this function, so you may or may not have this option available to you.

5 Appendix A – Initial AQS Setup

This section provides instructions on the one-time setup that is required on each computer that will interface with AQS. There are two (2) pieces that you will need to install: Oracle JInitiator and the JavaBean Certificate.

5.1 Oracle JInitiator

To begin setup, click the following URL Link:

<https://iasint.rtpnc.epa.gov/forms90/f90servlet?config=aqs&form=A000.fmx>

Clicking this link will download approximately 10MB of software, so it may take a few minutes depending on your connection speed.

If prompted, click "**Accept**" or "**Next**" to download this plug-in and follow the default installation to install it in the following directory:

C:\Program Files\Oracle\JInitiator 1.3.1.18.

If the JInitiator 1.3.1.18 does not install and you have not installed it previously, then you probably need your network administrator to install new software for you. Do not proceed until the new JInitiator is installed. Also have your network administrator do step 2 below as well.


AQS will attempt to start but will fail, probably with a java error message something like this:

Java.lang.ClassNotFoundException:oracle.forms.engine.Main

Wait for the error message, then close that window and go back to this page.

5.2 JavaBean Certificate

This step updates the security certificate on your PC.

- 1) **Right click** on [run_me_after_jinit_install.txt](#) file  (35KB dated 1 Mar 06) and save it to your desktop ("Save Target As" if you are using Internet Explorer).
- 2) **Right click** the icon on your desktop for this file and **rename** it to `run_me_after_jinit_install.bat` to continue with this setup.
- 3) Run (i.e., **double click**) `run_me_after_jinit_install.bat` on your desktop and accept the default file location. (You may see a window with text scrolling by quickly, then that window will close.)
- 4) **Close your browser and restart it before accessing AQS.**

- 5) Navigate to <http://www.epa.gov/ttn/airs/airsaqs/> and select **AQS Web** from the sidebar -- or -- go directly to <http://www.epa.gov/ttn/airs/airsaqs/aqsweb/aqswebwarning.htm> and click the link dated 3-Mar-06 "I agree to these terms and want to enter the AQS application."
(You may want to bookmark that address.)

5.3 CDX Registration

New users need to register on CDX using the registration key you received in an email. Use this link to access [CDX Registration](#). If you are asked to choose a role during the registration process, select the role of "submitter".

Once you have completed the CDX registration, close your browser and reopen it before attempting to use AQS and CDX.

If you need assistance accessing any of the material in AQS, User Support is provided through the Customer Call Center. The toll free number is **866-411-4EPA** (866-411-4372). Please contact them first with any questions about using the AQS application.